ELECTRICAL REVIEW

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3rd September, 1948

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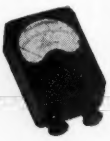

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXLIII. No. 3693. 3rd SEPTEMBER, 1948 9d. WEEKLY

Domestic Installations

PROTECTING CIRCUITS AND CONSUMERS

WHILE accidents in the home due to electricity are very few indeed compared with those from all causes, there are more of them than there need be. The figure may be expected to increase with extending applications of electricity, though nothing like in proportion to the kWh consumed. The prominence given to them has been a deterrent to electrification, and even on those grounds alone it is incumbent on electrical engineers to work for their elimination as far as possible.

On the other hand, the problem of lowering the accident rate from shock and fire becomes more complex as time goes on. In addition to the growth in the number of more or less electrified homes, there are the increase in the capacity of individual installations (e.g., those in many prefabricated houses exceed 11 kW) and the growing age of installations everywhere, a considerable proportion of which do not conform to modern ideas.

Misuse and Neglect

Most accidents, such as those referred to in our issue of 6th August, are due to misuse or inadequate maintenance of appliances or their connections. In several instances, however, the insertion of switches in the neutral wires provides evidence of gross carelessness in installation work by presumably skilled persons.

The public does not and should not be expected to possess a knowledge of when an installation is obsolete or unsafe for other reasons. While the supply undertakings have had only somewhat sketchy powers in this respect, their representations regarding action that should be taken by consumers in their own interests have generally yielded good results. The system introduced in Preston, for example, for inspecting old installations with a view to remedying defects received the almost unanimous co-operation of householders.

Regarding problems arising out of the magnitude of the installation, the most important is the increase in the ratio between fuse or circuit-breaker setting and earth-leakage current. Sufficient protection against the latter was formerly provided by the low fusing currents necessary to prevent overloading of a circuit.

High Ratings and High Resistance

With the greater loading of apparatus common to-day, persistent leakages, too small to blow the fuses or circuit breakers with their high overload settings or even, it is said, to trip a voltage-operated leakage device, might yet be enough to start a fire. Moreover, the ratio of overload to earth-leakage currents tends to become greater in some districts on account of the higher resistance of earth paths as a result of the use of non-metal water mains. Especial difficulty is found in rural areas supplied by overhead lines, where the easy return to the substation neutral by way of the cable sheath is not available.

Earth-leakage protection of the differential current-operated type with a suitable ratio between the two currents would provide a remedy, but the cost of manufacture might be expected to be too high in relation to the total cost of connecting

small consumers. Bulk buying might lower production costs; the criterion would be their relationship to fire insurance premiums. The biggest scope for such a device would probably be in small factories, but whether in factories or residential premises it need be fitted at the outset only where tests showed the installation to be below standard. By drawing attention to a curable defect it might save its cost by prolonging the safe life of the wiring. The possibilities of this form of protection will no doubt be considered by the E.R.A. and by the Inter-departmental Committee concerned with accidents of all kinds in the home. Its application will be a matter for the Area Electricity Boards to consider.

TELEVISION PLANS

By its clear announcement of policy in the matter of television the Government has removed the heavy uncertainty which lay upon both manufacturers and potential "viewers." The manufacturers can now go ahead with their production programme which they have announced as 500,000 receivers in the next three years. This envisages a tremendous increase in the number of viewers in that period; at the end of May there were 52,500 television licences in force. The American manufacturers, according to a statement made last week, are too busy meeting home demands to bother about the European market at present. British makers will thus have a good start in this market if Continental countries adopt the British system.

COAL AND ELECTRICITY

At last week's Summer School of the National Coal Board (see page 377) Mr. Alfred Robbins touched on the subject of fuel co-ordination and expressed the view that the practical policy was a compromise between compelling the consumer to use a particular fuel for a particular purpose and freedom of choice influenced by price differentiation and propaganda. Co-ordination of another kind was dealt with by Mr. E. H. Browne—between the Coal Board and the British Electricity Authority. First they had to decide between themselves whether it was cheaper to transport coal or electricity, involving the consideration of the relative siting of collieries and power stations. Secondly, they had to reach accord in the matter of the burning of inferior fuels, one question being whether it was not more "efficient" (in an overall sense) to burn high ash content coals than to go to the expense of washing them to reduce the ash content. Mr. Browne realized that the price would have to be such as to justify the higher plant costs involved.

JULY EXPORTS

Some contraction of the export figures for July was expected to result from the delayed effects of the London dock strike in the previous month. Whatever influence the strike had, however, was more than made good, for a new high level was reached, with electrical equipment supplies to overseas markets for the first time exceeding a value of £9 million (the actual total was £9,573,902). Allowing for the fact that the month contained the maximum of twenty-seven working days, and that there is always a tendency to clear documents before the holidays, the month's total still represents a very gratifying achievement. Both wires and cables (£2·24 million) and electrical machinery (£2·69 million) exceeded the respective end-1948 export target figures. Among the latter, f.h.p. motors in particular made a good showing, amounting in value to £193,000 against an average of only £11,500 in 1938.

SIGN CONTROL

When, if ever, illuminated advertisements are permitted again manufacturers of neon signs will have to take heed of rules just laid down by the Minister of Town and Country Planning (Town and Country Planning (Control of Advertisements) Regulations, S.I. 1948 No. 1613, H.M. Stationery Office, 8d.). It is provided that advertisements may be erected on business premises subject to limitations of area and size of lettering, unless the local planning authority has other ideas. Local planning authorities will decide whether advertisement signs of other types may be erected and, apparently, even if consent is obtained the limitations on size may still apply at the authorities' discretion. Consent may not be for a period of more than three years without the Minister's approval although consent may be renewed at the end of the period. The regulations apply not only to exterior advertisements but also to illuminated interior advertisements visible from outside.

BY the courtesy of James Johnston & Co., of Elgin, Ltd., we were recently able to see in their mills at Elgin, in the North of Scotland, the electrical applications to the various processes employed in the production of cloth from the rarer wools such as vicugua, cashmere, camel, alpaca and mohair, and the finer qualities of sheep's wools.

It is seldom we hear of such a long history of progressive development as that relating to these mills, which were started in 1796. Then they had their own water power on which the plant depended entirely; since then the power source has been converted progressively to steam, suction gas, private generation and finally and recently to public supply, with some of the still reasonably modern steam reciprocating private-generation plant retained for peak-load emergency use. This evolutionary story runs parallel with that of the manufacturing plant, and with it the electrical equipment, which continues to be extended, converted and replaced in line with commercial and technical developments, with the result that we saw many examples of new and older equipment and modifications throughout the installation, and we consider the consequent mixture of group and individual driving to constitute a well-balanced scheme.

Cloth Production from the Rarer Wools

The wool is received at the mills in large bales and as required it is removed from the wool store for scouring to remove the natural grease. This is done by a scouring machine which consists essentially of an aligned system of bowls or wooden troughs through which the wool is passed in a solution of soap and water. The wool is fed into the first bowl at one end of the machine from a hopper, and it is passed along the bowl by " forks " to which is imparted a crank motion—in-forward-out-back. In each case the wool is passed from one bowl to the next by a slat conveyor.

Although only one motor serves this machine it is essentially a group drive. The 5-h.p., 705-r.p.m. motor is recessed in the wall of the scouring room, and there is a 3-to-1 ratio transmission up to a main line shaft installed above the centre of the machine.

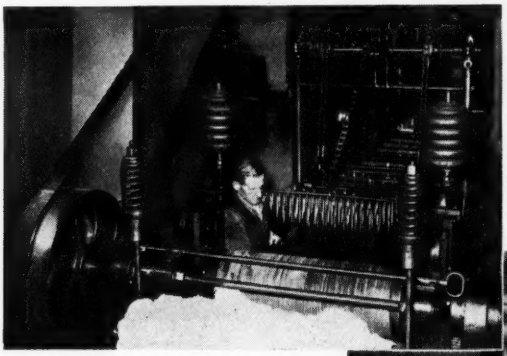
From this shaft there are three similar transmissions, each to a countershaft serving one section of the machine. From each countershaft there are two transmissions of similar ratio down to the machine section, one to the feeding end of the bowl where transmission is continued through pinion gear and the crank motion for the forks, and the other to the delivery end to pinion gearing which serves both a pair of rolls, which squeeze most of the liquor out of the wool, and the slat conveyor.

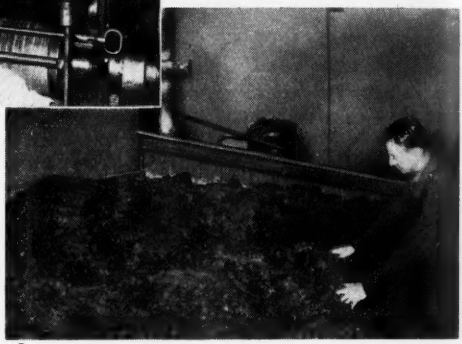
The next process, drying, is carried out in tray-like containers, each about 30 ft long and 8 ft wide, in which the wool is spread out over the coarse-mesh bottom of the trays. Hot air is blown up through the mesh and wool.

Enclosed chambers underneath two drying

The mules are subjects of some excellent group-driving schemes as shown in the title picture

trays are connected with a steam-heated cabinet into which cold air is first passed by a 3-h.p., 700-r.p.m. motor-driven fan inside the heating chamber. The motor itself is outside the chamber and the belt transmission is of even ratio.



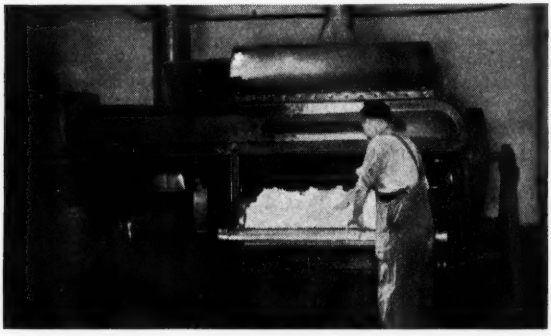


In the scouring machine (above) the wool is passed along the bowl by forks. Wool is dried (right) in tray-like containers, a current of hot air being blown through it from underneath

Dyeing is the next process when the wool is required to be dyed at this stage. For this there is a machine with a vertical cylindrical container, about 6 ft in diameter, which has a perforated false bottom about a foot above the real base, and a central vertical circulating shaft or funnel. Beneath the false bottom is a propeller on a shaft which extends upwards through the centre of the funnel. The wool remains stationary in the container and the dyeing liquor is drawn down through it by the propeller and passed up through the funnel to be ejected again into the container through holes in the top of the funnel. The propeller runs at about 400 r.p.m., which speed is stepped up from about 200 r.p.m. at a countershaft through a jockey-pulley arrangement.

The drive is a group one, however, and the countershaft is driven at even ratio from a main line shaft which also serves three yarn-dyeing machines to be re-referred to later. The floor-mounted motor is a 10-h.p. machine and the upward belt transmission affords about 200 r.p.m. at the main shaft. After treatment in a high-speed centrifugal hydro-extractor which removes the bulk of the liquor, the dyed wool is subjected to the drying process already described.

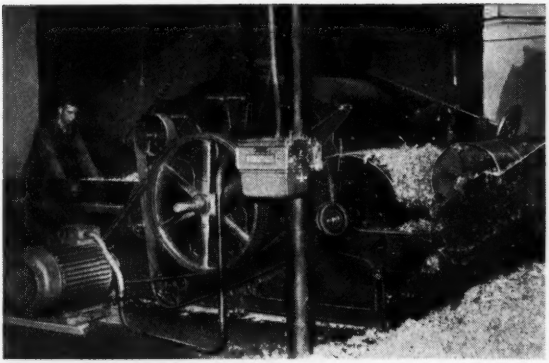
Two processes of teasing, crude and fine, follow. In the first teasing the wool passes between each of two rolls and a heavy cylinder fitted with large spikes which open out the matted material in preparation for the fine teasing. One slat conveyor feeds the wool to the rolls and another receives the material from the rolls. From this second conveyor the material is sucked up into a fan and trunk system which deposits the wool near the final teasing machine. A 20-h.p., 1,460-r.p.m. motor transmits by V-belt with a 3-to-1 ratio reduction to the cylinder



The 20-h.p. motor of the first teasing-process machine serves both the slat feeding conveyors and the fan

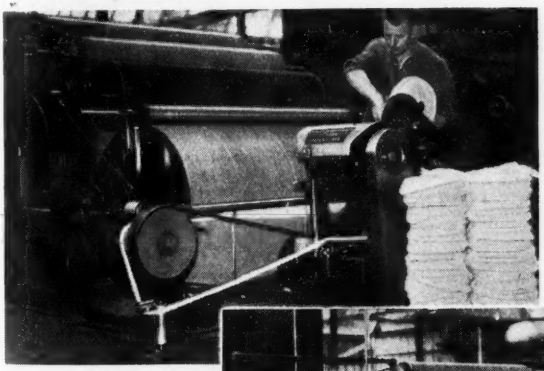
shaft, and from this shaft there are transmissions to both the slat conveyors and the fan, the fan being up-speeded to about 2,000 r.p.m.

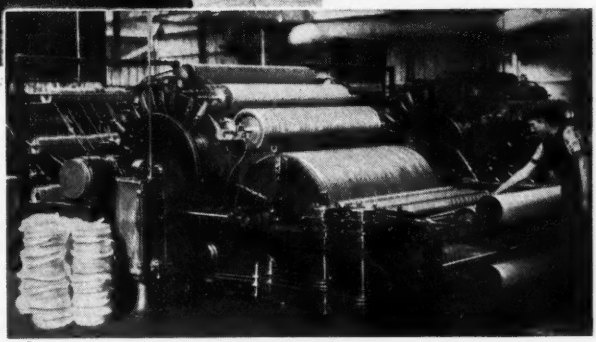
On the final teasing machine the fibres of the wool are pulled apart and well mixed in a system of toothed drums and a cylinder, and to facilitate



On the final teasing machine the fibres are pulled apart and well mixed in a system of toothed drums and a cylinder

the subsequent operations of carding and spinning a small proportion of water and oil is applied to the wool as it enters the machine. The drive here is a simple scheme, a 12-h.p., 720-r.p.m. floor-mounted motor with a 5-to-1 reduction V-belt transmission up to the cylinder shaft.





From the first and second carding sections the layer of loose fibre is converted into a rope which is fed on to a coiling drum. On the third carding-machine section (condenser) the final doffer has alternate rings of spikes and spaces (right)

Carding is a sequence of operations carried out by three machines which may be regarded as three sections of the same machine, although each section has a separate drive. In the first instance the still rather "lumpy" wool is hand fed into a hopper at one end of the train of machines. It is then passed on by a toothed lattice conveyor to a scale pan in the automatically-fed machine which tips it on to another conveyor from which it is fed, in turn, to feed rollers, taker-in rollers and on to a large cylinder which has a spiked surface like a wire brush. On its way round the cylinder the wool is also engaged by smaller (worker) rollers which comb out the fine fibres and further mix them. On the same machine an intermediate cylinder (doffer) passes the wool on to a second and similar combing system, and finally on to a second doffer cylinder from which it is removed as a horizontal layer of

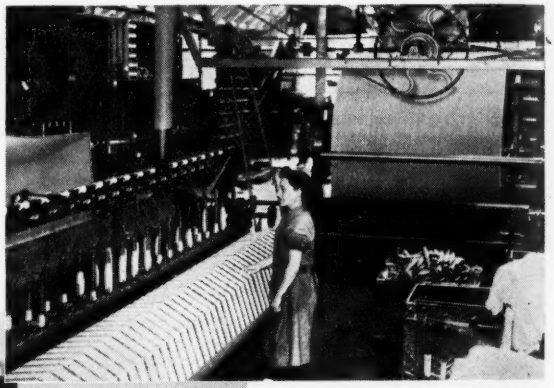
loose fibre by a side-to-side reciprocating comb and passed longitudinally along the doffer through a twisting device which converts the layer into a "rope" which is then fed on to a coiling drum.

All this is repeated on a second, similar machine which produces a better mixed rope. Again the process is repeated on a third machine (condenser), but in this case the final doffer has on its surface alternate narrow rings of spikes and blank spaces, with the result that the fibres leave the cylinder as a number of loose films or rovings—one per toothed ring. The rovings then pass over leathers with a lateral reciprocating action which bunches the fibres into threads. These are passed on to bobbins.

Each of the three carding machines—or major sections, for it is important to regard the whole as one continuous process—has a 3-h.p., 1,450-r.p.m. double-reduction geared motor drive, with a final shaft speed of 90 r.p.m. Transmission is direct to the second cylinder shaft and there is belt transmission between the two cylinder shafts. Thence a chain-gear train serves all the worker rollers. The motor is served by a Brookhirst contactor starter under push-button control.

The thread is now ready for spinning, and we saw both mule and ring spinning being carried out. The mule has two major sections—one stationary on which the bobbins from the carding machines are mounted, and a moving carriage which receives the threads on spindles from the bobbins on the stationary section. The carriage first runs out a few feet from the stationary section and the bobbins rotate, each to "deliver" a length of thread. Before the carriage has completed its run, however, the bobbins stop and during the completion of the run of the carriage the threads are "drawn." Then the carriage stops for a time while the spindles continue to revolve, thus effecting the "spinning." The carriage then returns and the sequence is repeated again and again.

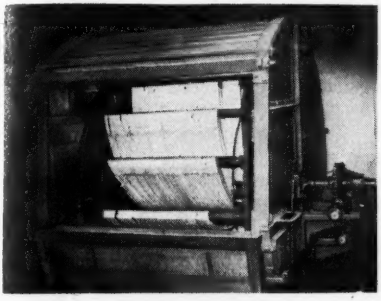
The mules are subjects of some excellent group-driving schemes. Four mules are served by a 20-h.p., 725-r.p.m. motor suspended from the roof structure. There are two 3-to-1 V-belt transmissions, one to each of two roof-level countershafts, and from each of these shafts there are two even-ratio transmissions down, each to the headstock of one of the mules.



When the yarn is required to be dyed it is wound into hanks on a collapsible frame (above). Ring spinning machines with between 80 and 100 spindles are each driven by a 10-h.p. motor (left)

On the all-stationary ring spinning machines each thread, on its way from the bobbin to the spindle, passes between two pairs of rolls which travel at different speeds. The result of this difference in the speeds of the rolls is the "draft" or drawing which is the same as the effect of the period of the stand-still on the mule spinner, i.e., when the spool is stopped and the carriage continues to advance. A ring-spinning machine accommodating between 80 and 100 spindles

is driven by a 10-h.p., 725-r.p.m. motor with Brookhirst contactor starter. The motor is directly coupled to the main shaft of the machine which carries a drum from which there are individual cord transmissions to the



In the dyeing vats the hanks are stretched between inner and outer members of a revolving wheel

spindles which are up-speeded to about 2,000 r.p.m.

The exact sequence of the processes at about this point is not the same for all types of product, but generally speaking, when the yarn is not required to be dyed it is taken direct from the spinning machines and stored until it is required for weaving on the bobbins on which it has been spun. When, however, dyeing is required the bobbins are introduced to the reeling machine on which the yarn is wound into hanks on a collapsible frame built up on spiders. The frame is a long affair and about 50 hanks may be wound on to it in one operation.

In view of the size of this machine it is rather surprising at first to find it is served by such a small motor—1 h.p., 940 r.p.m. This motor is suspended from the roof structure and there is a 4-to-1 reduction belt-transmission to a central shaft serving two reeling machines. From this central shaft there are even-ratio transmissions on either side, first to a secondary shaft and then down to the shaft of the collapsible frame.

In the dyeing vats the hanks are stretched between outer and inner members of a wheel which revolves vertically, the yarn on the lower part of the wheel at any moment thus dipping into the dye in the tank at the bottom of the machine. Once in each revolution of the wheel each outer member is given a turn when its clutch gear meets a tripping bar, and in this way the position of the wool is constantly altered as the wheel revolves. Three of these yarn-dyeing machines and one wool-dyeing machine referred to earlier form a 10-h.p. group drive.

The concluding instalment of this article will deal with the weaving processes.

Next Week's Events

Monday, 6th September

LIVERPOOL.—Liverpool Engineering Society, The Temple, Dale Street, 7.15 p.m. Association of Supervising Engineers, Liverpool Branch. "Electrical Quiz."

SHEFFIELD.—Royal Victoria Hotel, 7.30 p.m. A.S.E.E. Sheffield Branch. Exhibition of technical sound films.

Tuesday, 7th September

SOUTH HARROW.—St. Hilda's Hall, Northolt Road, 7.30 p.m. A.S.E.E. North West London Branch. "Maintenance of Factory Equipment," by A. Carpenter.

Wednesday, 8th September

BRIGHTON.—British Association meeting (8th-15th September).

BIRMINGHAM.—James Watt Memorial Institute, Great Charles Street, 6.45 p.m. Institution of Electrical Engineers, South Midland Students' Section. Address by the chairman, J. W. Lawton, on "The Storage Battery."

Thursday, 9th September

CARDIFF.—South Wales Institute of Engineers, Park Place, 5.45 p.m. Illuminating Engineering Society, Cardiff Centre. "Lighting of Docks and Railways," by L. F. A. Driscoll.

Friday, 10th September

CREWE.—Crewe Arms Hotel, 7 p.m. A.S.E.E. "Transformer Protection," by A. Lightbourne, A.M.I.E.E.

Friday-Sunday, 10th-12th September

BUXTON.—Institution of Electrical Engineers, Transmission Section. Summer visit.

Sunday, 12th September

I.E.E. North Midland Students' Section. Social outing to Bridlington, Butlin's Holiday Camp and Filey.

Australian Television

The Commonwealth Government recently announced the early building of experimental television stations in Australia. Manufacturers in the United Kingdom and the United States will be invited to submit tenders for television equipment by November, in order to enable the Postal Department to erect transmitters early in 1949.—*Reuter* (Canberra).

Views on the News

By REFLECTOR

LAST week I was among the many who thronged the exhibition halls at Olympia to inspect what was clearly the most comprehensive collection of British, American and Continental machine tools that has ever been on view to the public. I discussed the exhibition with several overseas visitors and without exception they were very favourably impressed. One American who apparently had no idea that we were capable of doing things in such a big way thought our show even better than the one which was held in Chicago last autumn. He also expressed the opinion that the British machine tool industry had " pulled its socks up " to such an extent that it was now producing equipment which was as good as, if not superior to, many American makes. It is most encouraging to hear such sentiments at this time and if the feeling is general, as it may well be, our export trade will benefit considerably.

✦ ✦ ✦

Reading the leaderette on " F.H.P. Motor Production " which appeared in the *Electrical Review* of August 20th, I was reminded of a conversation I had recently while in Switzerland with the British Consul at Berne. Mr. Frank Dixon considers that most scope for electrical imports into that country is provided by motors up to 1½ h.p. and that much depends upon the fulfilment of promises as to delivery. Hydro-electric resources at present developed are inadequate to meet the growing demand for electricity there and, since almost all fuel and raw materials are imported, the balance struck between these and the local finished products is difficult to account for. Mr. Dixon ascribes it to hard work, which seems to me the only adequate explanation.

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Having regard to the *Electrical Review's* insistence for many years on the need to encourage electrification as a means of using inferior coals, it is gratifying to read in *Fuel and Efficiency News* for August the statement by the Minister of Fuel and Power. Mr. Gaitskell urges that the amount of coking and gas coal and large coal mined is far less than is required, especially in view of their value for export. On the other hand he points out that there is likely to be an excess of untreated smalls and that electric power stations are taking nearly two-thirds of their fuel in this form—that is, as much as they can without serious loss of boiler capacity. The position would, of course, be greatly improved if the capacity of generating plant were adequate.

✦ ✦ ✦

From time to time it has been suggested that Birmingham should have an underground railway but any hopes of such a scheme appear to be dashed by a recent report on the subject by the City's Public Works Committee. It is said that the maximum possible annual revenue from such a system would be about £730,000 but actually only £350,000 could be anticipated with any confidence. Loan charges on the £13,750,000 involved in construction are put at £700,000 and the running costs of an adequate service at £481,800. Thus there would be an annual loss of £831,800 which reduces the proposals to absurdity. I see that construction costs are given as £1¼ million per mile. Long before the war the cost of the London Underground was stated to be about £1 million a mile and so the Birmingham estimate seems to be optimistic.

✦ ✦ ✦

The *Manchester Guardian* points out variations in the obligation of members of boards of nationalized industries to attend meetings of these boards. While governors of the B.B.C. must not stay away for more than three months without permission, members of the National Coal Board are given six months' grace. Members of the British Electricity Authority and Area Boards are also unable to be absent from meetings for more than six months " except for some reason approved by the Minister." Apparently no distinction is made in the regulations between whole-time and part-time members.

✦ ✦ ✦

An unusual aspect of electrical development in Abyssinia is revealed in an article on " Ethiopian Justice," by F. Elwyn Jones, M.P., in last week's *Spectator*. Mr. Jones says:— " In the Abbis Abbaba jail an electric chair has been installed. I was assured that this was a gift from U.N.R.R.A.—which, if it is true, must surely be the grisliest manifestation of ' relief and rehabilitation ' of all time."

Writing a Technical Paper

Genesis, Preparation and Presentation

By G. E. MOORE, M.I.E.E.

As a rule the creator of an original idea does not elect to keep it secret or restricted, though one or other circumstances may require this. In the workaday world creative efforts are severely practical—the inventor expresses himself in a system of work or in a material product; but if he be deeply interested he will want to explain it and have it discussed, and will turn to such media as writing and speech. This is a natural and not narrowly egotistic impulse.

The members of such institutions as the I.E.E., the "Civils" and the "Mechanicals" have in their respective journals a means of expressing themselves in print, many published papers having the special benefit of discussion at meetings and in correspondence.

Preparations

The would-be author should examine his prospects quite critically and objectively. He must be really satisfied that his subject and treatment are suited to the formal big-scale setting and be ready for the sustained work which may be entailed. He may naturally think in terms of his paper being not only printed but also discussed at meetings—and certainly discussions not only give the author's effort a special cachet but they can be extremely enlightening to hearers and author and later readers. And here it should be pointed out that short as well as long papers may be accepted for spoken discussion. Papers there are, however, which are too involved, theoretical, or mathematical for other than study purposes and written discussion.

Incidentally, I.E.E. student-members should not be backward in this particular activity: the benefits to author and Student Sections are very marked, and it may truthfully be added that the freshness, originality and brevity of many students' contributions make them appeal to senior members.

The would-be author must give careful thought to his subject matter. It is presumed that he knows his material must be original; indeed, he should be motivated by a belief in its novelty as well as in its wide appeal. It may be invention, process, theory, report—even summary of conditions or developments not generally known. He can prove the value of his proposed paper by first sending a synopsis.

Perusal of journals, attendance at meetings, and occasional contributions to discussions all help one to become "paper-minded." The Institutions give ready assistance; and there should be obtained from them the special leaflets. (Incidentally, the I.E.E.'s advice in "Students' Sections Papers" is useful to *all* aspiring authors.) From these will be gleaned information dealing with (for example) submission times, orthography, punctuation, length, symbols, the system of considering manuscripts, the "reading" of accepted papers, and the facilities for exhibition of novel apparatus.

By the leaflets, and later in his dealings with them, the author will find that the Institutions have a code of paper-presentation practice. He may jump to the conclusion that their requirements are oppressively limiting and meticulous—the editing, for instance, may be drastic and run counter to some of the author's grammatical and other conceptions. It must, however, be realized that the Institutions have always (and rightly) set a high standard; this naturally calls for a certain conformity—and not merely in technical symbols. Yet, on the whole, a fair measure of author-individuality is allowed, and there is no lack of patience, explanation, expert help and even compromise on their part.

The Main Task

At last, after the preliminary "casting around," the author must address himself to the job of writing the paper. Happy is he whose material, in notes and the like, already has some suitable semblance (however vague or incomplete)—the heavy initial effort is much relieved thereby! In any case he should draw up a skeleton draft which itself can form the basis of a logically-told account: beginning with an introduction, presenting the main work in a clearly-developed manner, and then setting forth the conclusions. (A very brief summary must precede the introduction, but this should be added after the paper has been written—both it, and the introduction in its

final form, naturally "tie up" better if written then.)

This is an appropriate moment for making reference to a requirement of the I.E.E. that the text should be sectionalized and numbered according to the decimal method. By this method sections are numbered (1), (2), (3)...., the main divisions (for example) of No. 1 Section being (1·1), (1·2), (1·3).... and sub-divisions of (say) (1·1) being (1·1·1), (1·1·2), (1·1·3)....

To the writing tyro, or to an author unaccustomed to it, this method may appear mechanical and repressive. Yet it encourages logical development and assists referencing; and if the "skeleton" is made up of section and subdivision heads (not necessarily in final wording) it will be found that the first draft of the paper can be written around them, and as the paper takes shape divisions and sub-divisions can readily be added or altered in position. Compactness of thought and presentation are encouraged. As a paper is usually written in the intervals of a busy engineering life, the ease with which a particular portion can be written and continuity ensured later is very welcome. Decimal numbering can be deferred until the draft is in its final stage.

Assembly of Sections

At this point there may be second thoughts as to the order of subdivisions, but the numbering can take account of this and the typist instructed to position them properly. Quantity of paper permitting (and, after all, the first draft can be on the blank sides of used sheets) each sub-division may be given a separate sheet and the sequence altered at will. The present writer has, however, found that his usual method for reports, articles and the like is effective for a paper—cheap exercise books are used, the right-hand pages employed for the main text and left-hand pages serving for additions, amendments, typing instructions, or even complete page re-writing.

The first draft having been completed, it is a good plan to put the MS out of sight and mind for some days or weeks, returning to it eventually for a fresh check-over. This may prove a heavy and perhaps dispiriting job—after all, a paper is not only a piece of writing but contains technical matter; and it is now that a special effort must be made to ensure that the technical details are presented in as direct and simple and *readable* a manner as possible.

The lapse of time since the pen was laid down greatly helps the self-critical author to simulate a remote reader. It may be that the MS "reads well" and merely needs minor changes. If, however, one's reactions are unfavourable (the text may be tedious, or the facts unimpressively marshalled) it is well worth writing a second MS with the general guidance of the first; this usually results in the mind being stirred afresh and the style made more flowing. Bold and decisive revision at this stage is profitable.

The Paper Takes Shape

And now, whether the MS has been written by hand or typewriter, it should, after correction, be typewritten as neatly and "finished" as possible. If all is going well the paper will by this act have taken form. The author can regard it as having come into existence. It will almost certainly be fated to amendment, but probably its writer will never again feel that it is anything other than a separate entity.

The final draft made satisfactory, the paper should be prepared for submission. It must be on foolscap, in duplicate, on one side with generous left-hand margin, and double-spacing is advisable; it should be bound on the left. Illustrations, too, should be in duplicate. There are special instructions as to these, and here one need only point out that clarity and simplicity are vital, that for reproduction purposes line drawings are preferred to photographs (the latter are best in the form of lantern slides for use at readings), and that drawings in the *first* instance may be blue prints. Each illustration should carry a reference to the paper on its rear side, and also have a brief caption attached to it.

The paper dispatched by registered post (we will leave the sender to declare its value and enjoy his holiday!) let us see what now happens to it if it has gone to the I.E.E. From the Secretary it passes to the Papers Committee, which can call upon the committee of an appropriate specialist Section to consider it. Referees independently report upon it, and their remarks are given due weight when a committee decision is made as to acceptance.

Final Work and Ordeals

In the event of qualified acceptance one copy of the paper will return to the author, together with a covering letter of advice and copies of the referees' reports. The

advice and reports should be carefully considered. The referees will not necessarily agree with each other—one may possibly, on a particular point, take up an entirely contrary view to another! Nevertheless, unless it be on a matter of principle or of fact, the author is well advised to regard the referees as a cross-section of interested technical readers and endeavour to meet their criticisms. Even differing opinions may be answered by partial re-writing.

More assured now, the author can modify his paper. It should preferably be re-typed, but not in duplicate. In order to avoid changes (which may be expensive) after the printer has set up the type, this version should be as ' finished " in all senses as possible. Acceptance is followed in due course by a printer's proof in galley form being sent to the author. As was the case when it came off the typewriter as a final draft the paper should have gained in effectiveness.

The author will probably note that his MS has been edited somewhat, and also that corrections have been made already to the proof. It is his job to run carefully through the text and add his own corrections in the margin on either side. Certain signs are used for this work—they are to be found in one or two reference books and dictionaries, but changes can be indicated by writing the required wording in the margin. Any special explanation from author to editor can be added vertically. Later will come the page proofs; and now, none but vital alterations may be made.

Thrust and Parry

The author whose paper is to be read as well as published has further work and ordeals awaiting him. Copies of his paper will be made available, and discussed at a meeting after the author has given a short talk about it. He must be " on his toes," for mistakes will be pounced upon and arguments critical. Let him carefully note each point and at the same time jot down his rejoinder. The discussion ended, he can then unhesitatingly make his reply to the discussion. His *considered* reply in writing will be required later, with the proof of the discussion before him. Should his paper take the fancy of other I.E.E. Centres he will have the same enlivening and educative experience there (the I.E.E. paying his travelling expenses). Incidentally, yet a further piece of writing will be required of him—an abstract (a column or two in length) for Part I (General) of the *Journal*.

It will be perceived that the writing of a technical paper is no simple lightly-undertaken task. Undoubtedly a certain facility with the pen is helpful, but deep interest and pertinacity are " top-level priority." One technical author has so habituated himself that he appears to produce papers and massive E.R.A. reports with every sign of ease and enjoyment. But most contributors are one-paper authors and regard their single production as a *magnum opus*.

The author goes to considerable expense in time and material (a fact which is little appreciated). He must find his main reward in doing the job and in making contact with fellow-members and their opinions at his meetings; incidentally, however, quite a number of premiums (about thirty) for students and corporate members are awarded by the I.E.E. Institutions and industry require a steady flow of papers—*practical* ones are particularly desired. He (or she) who is toying with the idea of making a contribution should not hesitate to do so.

Electro-Medical Supplies for Australia

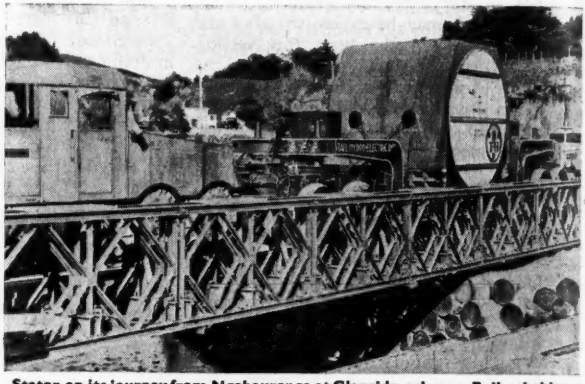
IN the course of a report on the market for electro-medical apparatus in Australia (a copy of which has been received from the Export Promotion Department of the Board of Trade), the United Kingdom Trade Commission in Sydney says that in the absence of detailed published statistics it is difficult to gauge the extent of the market for individual types of apparatus. In a population of about seven and a half million people the demand, however, cannot be very extensive, although the number of registered medical practitioners in Australia (some 7,000, or nearly one to 1,000 of the population) is understood to compare favourably with the ratio in the United Kingdom. Nevertheless, some scope undoubtedly exists for expansion in the trade in X-ray apparatus, particularly for industrial purposes and for miscellaneous uses, such as, for example, in retail show stores, although the latter are well catered for by local manufacture.

The main opening for a substantial increase in United Kingdom trade with Australia in electro-medical apparatus would seem to lie in the direction of X-ray tubes (comparable to the American range), in which hitherto the U.S.A. has secured most of the market. Ultra-violet lamps, to be incorporated into electrical fixtures locally, are also being exploited by local electrical equipment firms for the air-treatment of factories, offices and stores.

Heavy Plant Transport

SYNCHRONOUS CONDENSERS IN NEW ZEALAND

FIVE 30-MVA, 11-kV synchronous condensers have recently been manufactured by the British Thomson-Houston Co., for the New Zealand Government Hydro-Electric Department. They are to be used for the voltage regulation of incoming transmission lines. Each has air-cooling and water-cooling equipment. The order also includes 11-kV solenoid operated switchgear and neutral earthing cubicles, control panels, relay panels, temperature indicating equipment, and voltage regulating equipment for use with the condensers. The first machines have now reached New Zealand, the packed weight of each rotor being over over 44½ tons, and of each stator approximately 48½ tons. As roads and bridges in New Zealand have not been designed or constructed to take such heavy loads many difficulties had to be overcome in taking the plant to the site. Two of the condensers had to be transported from the docks at Wellington to the substation at Bunnythorpe, 94 miles away, and three are for installation in a substation at Otahuhu, 9 miles from Auckland.



Stator on its journey from Ngahauranga at Glenside, where a Bailey bridge was erected

To transport heavy electrical plant, the State Hydro-Electric Department had built in England a special trailer capable of carrying loads up to 50 tons. The trailer is equipped with 32 wheels on four axles and has pneumatic tyres. The wheels can be turned through 90 deg, so that the whole vehicle can be moved sideways if necessary. The weight of the vehicle itself is about 27 tons.

The Wellington and Auckland city authorities would not allow the plant to traverse streets and roads within their boundaries, and the railways could not carry all the pieces. In the case of the Bunnythorpe machines, the rotors were transported by rail from the docks at Wellington to the substation, but it was necessary to restrict train speeds to 8 miles per hour on the straight and 4 miles per hour on curves.

The stators were too large to go through certain tunnels and the stators were railed from the docks to the city boundary at Ngahauranga where they were transferred from rail wagon to road trailer by a gantry. They were hauled about 23 miles by road and then transferred to the railway for the rest of the journey. Over the road route it was necessary to shore up bridge structures and in some cases to by-pass bridges.

It was impossible to transport machines by rail or road from Auckland to Otahuhu, but as the substation is near the head of a tidal inlet it was decided to send the plant by sea. A barge capable of carrying the road trailer fully loaded was obtained and each rotor and stator lifted from the ship to the trailer on the barge and the barge towed to a point near the substation. At a specially built landing stage the trailer can be towed off the barge at suitable tide level to the substation, about half a mile distant.

Apprentice's Reinstatement

MR. W. F. Smalley, proprietor of F. W. Smith & Co., electricians, Southport, told the Southport Re-instatement Committee on 26th August that he was now employing more apprentices than was justified by the trade and he would not be able to find work to give Robert Metcalfe (20), who applied for his reinstatement as an apprentice electrician, his proper training. Mr. Smalley said business was very bad and with the restrictions on the use of electricity and the fact that charges to domestic consumers were to be greatly increased, the outlook was not too hopeful. He could prove by his books that his present staff had not been more than half employed for the past twelve months. He agreed that two of his apprentices were junior to the applicant. The committee ordered reinstatement from 2nd September and awarded £5 6s. 8d. for loss of earnings.

Correspondence

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents.

Domestic Demand

PAGE 257 of your issue of 13th August carries some ingenuous suggestions by Mr. G. H. Bowden for restricting domestic demand, which will no doubt please the fuse and switchgear makers if they are in a position to meet such impossible demands. In all these restrictive demands and suggestions, however, there seems no mention of the all-electric house, around which the present electricity supply for domestic purposes was built, in theory, if not quite in fact.

During the "Great Cut" my household froze and starved and generally suffered tortures of the damned because we, having nothing but electricity, were, willy nilly, disconnected with the rest of Mr. Bowden's (*a*)'s, (*b*)'s and (*c*)'s, to whom it mattered little, if at all, by comparison.

Will Mr. Bowden kindly say whether all-electric householders should just be classed with his "certain anomalies, difficulties and hardships," or did he not mean to go quite so far?

Bromley, Kent. R. WHEATLEY MINTER.

Transport Power Staff's Conditions

WITH the nationalization of the electricity supply industry the administrative, technical and supervisory staffs of the London Transport Executive generating stations had quite reasonably hoped that they would be brought into line with the rest of the country under the National Joint Board agreements to which the British Electricity Authority is a party. The L.T.E., however, apparently has no such intention, having turned down a request by members of its staff for N.J.B. rates and conditions.

Under nationalization electricity supply is electricity supply, no matter for what purpose it is used, domestic, industry, or transport, and the staffs of the generating stations should be covered by one national agreement. One L.T.E. generating station (Greenwich) is actually supplying approximately 2½ million kWh per week to the B.E.A. grid system, which surely bridges any gap which may be claimed to exist between transport and any other form of supply.

In view of the need for harmony in the industry, for the benefit of the whole country, I would suggest that the redress of this injustice is long overdue, and that the fact be recognized that, as the duties of the staffs are similar, so also should the conditions of service be similar. At present we are not covered by any agreement and just have to take or leave what the L.T.E. chooses to offer, which in itself is an injustice in these days of national negotiating machinery.

Surely it is inconsistent with the present general system, and with the expressed views of the Government, that such a large employer of labour as the L.T.E. should be allowed to remain outside the scope of such machinery to the disadvantage of its employees.

A SUFFERER.

Export Obstacles

YOU publish in your issue of 20th August a complaint of the Board of Trade that manufacturers do not use the language of the country to which a tender is directed. I would say that the Board of Trade is itself guilty of non-translation in far too many cases.

It is possible on any day of the week to pay a visit to the Export Promotion Department of the Board of Trade in London and to scrutinize specifications of electrical equipment just as received from the countries of origin. As few engineers in this country receive education in languages other than French and German and possibly Spanish, it is necessary for an interested manufacturer to take with him to the Board of Trade a hired linguist—in many cases only to find that the range of equipment required—kVA, frame size, voltage, etc., is beyond or outside his manufacturing limit. This is a costly and time-wasting practice. Surely it is not too much to expect that with the vastly increased size of Board of Trade establishments at home and throughout the world, all foreign specifications should be translated and made available to British manufacturers in London in English.

Another practice which is to be deprecated is the requirement that many tenders shall be accompanied by deposits in foreign currency and that the tender form shall be submitted with duty stamps. Commercial attachés overseas should urge that these requirements should be waived.

I am also doubtful if the Board of Trade possesses sufficient technical staff at Thames

C†

House to be able to form a sufficiently full appreciation of some specifications of a technical character. Only a few days ago I called to express interest in a Continental inquiry to find that the lengthy documents (in French) dealt fully with general conditions of contract and outlined a summary of sizes and voltages but referred the reader to separate sheets for the full technical specification and not one of these sheets was appended. An engineer, rather than a clerk, in the Board of Trade Inquiry Office would have spotted this omission.

T. G. MARTIN, A.M.I.E.E.

Camberley, Surrey.

NEW BOOKS

Protective Finishes for Metals : Plastics Encyclopædia

Chemical and Electro-plated Finishes. By H. Silman. Pp. 414; figs. 131; index. Chapman & Hall, Ltd., 37, Essex Street, London, W.C.2. Price 30s.

A very clear and concise account of the processes at present used for finishing metals is given in this book. It deals mainly with protective coatings, but, since coatings such as chromium, colour anodizing and even silver and gold can be considered as being protective as well as decorative, they are dealt with fully.

Mr. Silman has treated his subject in a particularly logical manner. The opening chapter on corrosion is probably one of the neatest accounts of this subject written into a single chapter. It describes all the essentials of the theory and effects of corrosion from a modern viewpoint. From this the author leads to pickling processes, polishing, degreasing and cleaning, before dealing with chemical coatings, plating plant and the individual electro-plating processes.

The author is chief chemist to Joseph Lucas, Ltd., and he has obviously drawn on his practical experience. For each process, he describes all the significant details and indicates the most suitable plant for small-scale working or for mass production. The book is well illustrated and should be invaluable not only to those managing finishing and plating shops, but also to those executives who have in any way to plan, organize or control metal finishing in production factories.—S.W.B.

British Catalogue of Plastics. (Second edition). General editor: E. Molloy. Pp. 800; figs. and index. National Trade Press, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. Price 60s.

The 1948 edition of this encyclopædia of plastics has been revised and enlarged to include over four hundred pages of new material. Since the first edition was published, striking progress has been made in the plastics industry, particularly in the development of new materials and manufacturing techniques. In extending the catalogue to embrace these new developments each section has been thoroughly revised and fifty-seven new sections added.

The manufacturers' data section has been brought up-to-date and the processes section has been divided to distinguish the primary and fundamental processes. The machinery, equipment and directory sections have been completely revised and additional chapters on r.f. heating and welding have been included. It is likely that the book will be warmly welcomed by those who are anxious to keep abreast with the latest developments in the industry and particularly by those who found value in the previous edition.—R. P.

Electronic Instruments. Edited by Greenwood, Holdham and Macrae. Pp. 721; figs 463; index. McGraw-Hill Publishing Co., Ltd., Aldwych House, Aldwych, London, W.C.2. Price 54s. in U.K.

This book presents the reader with an excellent introduction to and survey of the present state of knowledge of electronic instruments and the ever improving technique of servomechanisms. It is written in four main sections the first of which outlines the design of simple computing systems, together with illustrative applications of the solution of aircraft navigational problems. The second part discusses the more practical aspects of the design of lightweight, low power servo equipment with examples taken from various radar and gun-fire control applications. The last two parts treat accurately stabilized power supplies and the problems associated with prototype equipment, special emphasis being laid upon lightweight technique and the limitations of available components. The book is well written, mathematics has been kept to the minimum and the subject is presented in such a way as to interest both the advanced student and the practising engineer.—A.R.P.

Books Received

Electro-Plating and Anodizing. Editor, E. Molloy. Pp. 232; figs. 69; index. George Newnes, Ltd., Tower House, Southampton Street, Strand, W.C.2. Price 7s. 6d.

Magnetic Control of Industrial Motors. By G. W. Heumann. Pp. 589; figs. 365; index. Chapman & Hall, Ltd., 37, Essex Street, London, W.C.2. Price 45s. in U.K.

Two-Stroke Motor Cycles. By *The Motor Cycle* staff (10th Edition). Iliffe & Sons, Ltd., Dorset House, Stamford Street, London, S.E.1. Price 3s. (postage 3d.).

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE Southern Electricity Board has appointed **Mr. J. D. Markland,** M.I.E.E., A.M.I.MECH.E. (formerly borough electrical engineer, Maidenhead) to the Commercial Department in charge of sales and contracting in succession to **Mr. G. E. Taylor** who has been appointed general manager of the Creamery Package Manufacturing Co., Ltd., London.

A presentation was recently made to **Mr. William Stuart Curry** by the staff of his departments on his leaving the South West Scotland Electricity Board to take up his new appointment as purchasing officer with the British Electricity Authority, South East Scotland Division. Mr. Curry's new headquarters will be in Edinburgh.

Mr. W. McRobbie, one of the deputy county clerks of Dumfriesshire, has been appointed secretary to the Dumfries and Galloway Subarea of the South West Scotland Electricity Board.

Mr. C. W. Pass, M.B.E., of Crompton Parkinson, Ltd., is returning to London early in September, after visiting Central and South American countries.

Mr. J. R. Oliver, A.M.I.E.E., M.I.W., for several years head of the equipment development department of the Quasi-Arc Co., has been appointed general manager, Max-Arc Welders, Ltd., and the Max Electric Co., Ltd., Croydon.

Mr. Neville Harrison, late area supervisor for the E.L.M.A. Lighting Service Bureau, has been appointed to the staff of Cryselco, Ltd., as lighting engineer in charge of the Illuminating Engineering Department.

Mr. E. G. Phillips, O.B.E., M.I.E.E., M.I.MECH.E., has been asked by the Minister of Fuel and Power to resign from the chairmanship of the North Midland Regional Fuel Efficiency Committee on the ground that Mr. Phillips had mentioned that he was chairman of the Committee while acting professionally for a firm seeking a licence from the Ministry of Works. Mr. Phillips, who is principal of E. G. Phillips, Son & Norfolk, consultants, Nottingham, has denied that he had used his official position to his personal advantage and has announced his intention of asking the Association of Consulting Engineers to hold an inquiry into the matter.

The South Wales area final of the golf competition arranged under the auspices of the Electrical Industries Benevolent Association was held at the Southerndown Golf Club on 19th August. In spite of extremely difficult conditions most of the competitors succeeded in completing the course, with **Mr. R. E. Silvey** winning the Nichols-Moore Bowl and qualifying for a place in the national final to be held at Moor Park, Rickmansworth. **Mr. J. M. Faulkes** also qualifies to go forward to the final as runner up. The meeting concluded with a dinner after which the area chairman, Mr. Coope, thanked Mr. Faulkes, the area secretary, for his work in organizing the meeting and the qualifying competitions.

Dr. W. A. Macfarlane, director of fuel efficiency, Ministry of Fuel and Power, has been lent to the Department of Scientific and Industrial Research for appointment as director of the United Kingdom Scientific Mission in the British Commonwealth Scientific Offices in Washington. He will also be attaché for scientific matters in the British Embassy. The present director of the Mission, **Dr. F. N. Woodward,** is returning to this country towards the end of the year to resume his work as director of the Scottish Seaweed Research Association.

Obituary

Mr. H. W. Couzens.—The death occurred on 24th August at Chipstead, Surrey, of Mr. Harold William Couzens, M.I.E.E., the consulting engineer. Mr. Couzens, who was born at Totnes in 1871, was educated at Finsbury College, London. He was appointed borough electrical engineer of Taunton in 1892 but three years later joined the firm of Kincaid, Waller & Manville. In 1906, with the late Mr. Morgan I. M. Williams he started the firm of Morgan Williams & Couzens, consultants, and when Mr. Williams retired in 1912 he took Mr. D. A. Brown into partnership. Subsequently the partnership was dissolved and then with his son Mr. Reginald Couzens, Mr. Harold Couzens continued the firm of Couzens & Brown.

The late Mr. Couzens acted for, and was a director of, the Oxford Electricity Co. and he acted for many other supply companies and municipal undertakings at home and abroad and took a prominent part in the formation of the Wessex Electricity Co. and the Beds, Cambs & Hunts Electricity Co.

Mr. Couzens had been in indifferent health for some time. His son is carrying on his practice.

Mr. R. Willoughby.—The British Electricity Authority announces the death of Mr. R. Willoughby, B.SC., A.M.I.E.E., transmission engineer for the North Eastern Division. Until his recent appointment to the divisional staff Mr. Willoughby was senior assistant transmission engineer for the North East England Area of the Central Electricity Board. He was a Newcastle man and attended the Royal Grammar School in that city and took his engineering degree at Armstrong College, University of Durham. His practical training was obtained with Reyrolle & Co., and he was subsequently with the I.C.I.

at Billingham and the G.E.C., Witton, as technical assistant in charge of the automatic switchgear section of the Development Department. After joining the C.E.B. in 1931 he spent four years as section engineer and thirteen years as assistant to the transmission engineer. Mr. Willoughby had to undergo an operation soon after his appointment to the B.E.A. and was never able to resume work.

Mr. Victor D. G. Williams, for the past thirteen years chief designer on the Petters engine side of the works of the Brush Electrical Engineering Co., Ltd., Loughborough, was drowned on 24th August while bathing at Bude.

A memorial service to the late **Sir Clifford Paterson** is to be held at St. Martin-in-the-Fields, London, on 13th September, at 11.30 p.m.

WILLS.—Mr. Robert Patrick Sloan, C.B.E., M.I.E.E., a member of the Central Electricity Board, late chairman and managing director of the North Eastern Electric Supply Co., Ltd., and a director of other electricity concerns, who died on 6th December last, left estate in Great Britain valued at £59,683 gross (£59,032 net). Among his bequests were £3,000 to the Electrical Industries Benevolent Association, and £2,000 to King's College, Newcastle-upon-Tyne, for the endowment of a prize to be known as "The Sloan Prize in Electrical Engineering," to be awarded annually to such third-year student in electrical engineering as the Professor of Electrical Engineering and the Academic Board may approve.

Mr. William Leonard Baldwin, retired electrical engineer, late of Yarrow & Co., Ltd., who died on 5th May last, left personal estate in England and Scotland valued at £4,407.

Mr. Herbert Wilson, M.I.E.E., retired chief electrical engineer to the Ashford (Kent) U.D.C., who died on 8th July last, left £2,216 gross (£1,794 net).

Research in America

THE range of activities of the U.S. National Bureau of Standards, which is the principal Federal agency for research, is very wide and diversified. The summarized annual report shows that direct appropriations totalling 6·8 million dollars in 1947 were supplemented by 10·8 million dollars transferred from other Government departments and Federal agencies in respect of work done for them.

The work in physics, mathematics, chemistry and engineering is performed in 15 divisions, with four more concerned with administrative and internal service aspects. The staff of 2,500 includes 934 professional scientists and engineers with 566 sub-professional technicians and aides. An additional 73 research associates and 21 "guest" workers were stationed at the Bureau's laboratories in different parts of the country, but the bulk of the work is conducted in Washington. A considerable scientific advisory service is rendered and although the Bureau has resumed most of its peacetime activities, a large portion of its research and development work is still concerned with national defence.

Board's Armorial Bearings

THE second Electricity Board to be granted armorial bearings is the South Eastern. On a quartered shield there appear the white horse of Kent, King Edgar's crown from the Surrey arms and two martlets representing West and East

South Eastern Electricity Board's arms

Sussex. In the crest is a Catherine wheel radiant with electric power. The supporting lions hold banners bearing representations of thunderbolts and are collared "to denote control." They are connected by a cable "suggesting the complete circuit."

Electrical Engineering Courses

WE have received from Mr. W. H. Date, B.SC.(ENG.), M.I.E.E., head of the Electrical Engineering Department of the Polytechnic, 309, Regent Street, London, W.1, the prospectus of evening courses in electrical engineering, including telecommunications, for the 1948-1949 session. The work of the Department covers a wide field and includes preparation for the following examinations:—National Certificate, "Ordinary" and "Higher"; B.Sc. (Eng.), Parts I and II; A.M.I.E.E., Parts A and B; and the City and Guilds of London Institute.

In addition, the well-equipped laboratories are available for those wishing to prepare theses, or pursue advanced study of a particular subject.

Scottish Scheme Abandoned

THE North of Scotland Hydro-Electric Board has decided to accept the recommendation of its Fisheries Advisory Committee that the River Creed hydro-electric project shall be abandoned. The Committee's recommendations for the preservation of the salmon stock seriously hampered the scheme and rendered it uneconomic. Electricity is being generated for Stornaway and district by extension of the diesel plant in Stornaway generating station.

Institution Centres

CHAIRMEN FOR FORTHCOMING SESSION

BELOW we give a brief account of the careers of four of the Centre chairmen of the Institution of Electrical Engineers for the 1948-49 session:—

Dr. W. G. Thompson (*South Midland Centre*) received his engineering training as a pupil at Sir W. G. Armstrong Whitworth's Elswick Works, Newcastle-on-Tyne, and later at King's College, Durham University, where he was awarded the J. G. Smith prize and B.Sc. degree in electrical engineering with 1st class honours. Later he received the degree of Ph.D., and was awarded the Ferranti travelling scholarship with which he spent two years in Germany at the Technische Hochschule at Munich and Brunswick carrying out research in h.v. rectification. In 1933 he joined the research staff of the G.E.C. Research Laboratories, Wembley, and four years later was appointed assistant manager of the G.E.C. Rectifier Works, Witton. In 1945-46 he was a member of B.I.O.S. Team No. 7 investigating industrial development in Germany. He is the author of many papers on research and engineering subjects, and in successive years was awarded a Student Premium and the Silvanus Thompson, Kelvin, and Hopkinson (twice) Premiums of the I.E.E.

Dr. W. G. Thompson

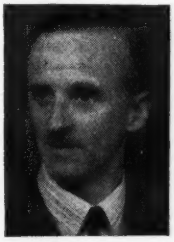
Mr. B. L. Metcalf (*East Midland Centre*) was educated at Oundle School and took his B.SC. degree at Glasgow University, later qualifying for the A.R.T.C. He joined Metropolitan-Vickers as a college apprentice in 1924. After a period on outside erection work in Russia he spent over five years with the Metro-Vick Export Co. in Japan before returning to Trafford Park where he subsequently joined the Mining Department. In 1939 he was appointed chief electrical engineer with Powell Duffryn Associated Collieries, Ltd., and in 1945 he joined the Brush Electrical Engineering Co., Ltd., with which he is now technical director. Mr. Metcalf is a member of the Institution of Mechanical Engineers as well as of the I.E.E.

Mr. B. L. Metcalf

Mr. B. W. S. Challans, M.SC.(ENG.), D.I.C. (*Southern Centre*) is with the Admiralty Signal and Radar Establishment, Haslemere, Surrey. He was educated at Battersea Grammar School and the City and Guilds (Engineering) College, and between school and college served at the Building Research Station, Watford, and the Radio Research Station, Slough. After leaving the University he served with Standard Telephones & Cables, Ltd., on the design of line-testing apparatus and then with A. C. Cossor, Ltd., on instrument design. In 1936 he was appointed to H.M. Signal School, Portsmouth, which during the war moved to Haslemere and became the Admiralty Signal and Radar Establishment. During the war he was responsible for the control of manufacture of all radio apparatus for the Admiralty and he is now engaged on the organization of library and information service.

Mr. B. W. S. Challans

Mr. S. R. Mellonie, A.AMER.I.E.E., A.M.I.I.A. (*North Western Centre*) is technical engineer, No. 1 sub-area (Manchester), North Western Electricity Board. He was educated at the Manchester College of Technology (of which he is an associate) and Northampton Polytechnic, London, and after serving an apprenticeship with Crompton & Co., Ltd., he held positions with Metropolitan-Vickers, A. Reyrolle & Co., the Admiralty and the B.T.H. Co. In 1929 he joined the Salford undertaking as electro-technical assistant, being appointed distribution superintendent in 1939 and deputy city electrical engineer early this year. Mr. Mellonie has held lectureships at the Marine School, South Shields, Rutherford Technical College and Gateshead Technical College. He has written a number of articles published in the electrical press on distribution matters and plant, and a translation of "Elements of Switchgear Design" (F. Kesselring) in which he collaborated with J. Solomon was published by Pitman's in 1932. He is on the E.R.A. Committee Sections Q and k/E.



Mr. S. R. Mellonie

Trades Union Congress

MATTERS TO BE DEALT WITH AT MARGATE

AN extremely wide range of subjects is covered in the report for 1948 of the General Council of the Trades Union Congress to be presented at the 80th annual congress at Margate next week. All aspects of industrial relations — national and international — are touched upon in the 429 paragraphs (254 pages). Among them is the spreading of the electricity load. The T.U.C. is represented on the Joint Electricity Sub-Committee which has recommended a national scheme for operation during next December, January and February between the hours of 8 a.m. and 12 noon and 4 p.m. to 5.30 p.m. The aim is to secure an absolute minimum of 80 per cent of the peak load. In October, November and March the necessary load-spreading arrangements should be made on a regional basis. The Joint Sub-Committee also strongly recommended that the highest priority should be given to the supply of workers and materials to the heavy electrical plant industry to enable the British Electricity Authority to accelerate its programme.

The T.U.C. was also represented on the Clow Committee on the reduction of the domestic peak load.

Increasing Productive Efficiency

Much attention has been devoted to the question of productive efficiency; the report says "it is now generally appreciated by the trade union movement that our present standard of living, including existing social services, depends on a greater output from our fields, factories and workshops." This increase is considered to be achievable in spite of material shortages and the General Council has been doing its utmost to increase the number of joint production committees in industry. In this connection the Council refers to its participation in the Anglo-American Council on Productivity.

Four pages of the report are allotted to the subject of workers' participation in management, most of the matter dealing with the nationalized industries. The Council considers that members of boards who are drawn from the trade union movement should not be merely "labour advisers," but should take part in shaping the general policy of the industry or undertaking. Greater consultation with the trade union movement in the cases of certain appointments to boards is considered desirable.

As regards the control of nationalized industries the T.U.C. Economic Committee is against a proposal to establish joint administrative boards, on which trade union representatives would sit in equal status with the management. The Committee considers that this would destroy the independence of the trade unions from the executive authority of the nationalized industries and the unions would be compromised in their relationship with both the public boards and with their own members.

The Union of Post Office Workers is not satisfied with this and the agenda for the annual congress includes a resolution from that union calling for the establishment of a joint Administrative Council for the Post Office to which staff and official representatives would be appointed in equal numbers and enjoy equal status. This, however, is followed up by amendments from the Post Office Engineering Union which would make the council advisory only. Resolutions from other unions aim at securing a greater share for the workers in the control of nationalized industries.

The General Council reports that it has been invited to submit the names of five persons considered suitable for appointment to the (Electricity) Consultative Council in each area and the T.U.C. Regional Advisory Committees have been asked to make nominations. In addition, the General Council has agreed to submit the names of the thirteen trade union district secretaries appointed by the trade union side of the National Joint Council for Electricity Supply as persons representing the employees of the industry.

Other matters dealt with at some length in the report are monopolies and price maintenance; the T.U.C. Scientific Advisory Committee of which Sir Robert Watson-Watt has become a member; and the proceedings of a Special Committee on the Economic Situation.

Among resolutions on the agenda is one from the United Rubber Works of Great Britain calling for the nationalization of the rubber manufacturing industry.

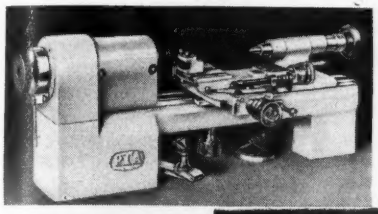
Welding Research

THE report of the British Welding Research Association, which has completed its second year as a fully accredited body supported by the D.S.I.R., shows that during 1947-48 membership increased by 39 to 172. Substantial economies in capital expenditure were instituted, some work was deferred and other items handed over to allied investigational organizations while administrative expenditure was revised by reducing the number of committees from 37 to 27. Consolidation under the directorship of Dr. H. G. Taylor best describes the changes made at the laboratories at Abington Hall, Cambridge, and Park Crescent, London; the staff numbers 51, about 20 of whom are at Abington. A new activity is the undertaking of research, under contract, for the Ministry of Supply.

Machine Tool Design

TRENDS OBSERVED AT OLYMPIA

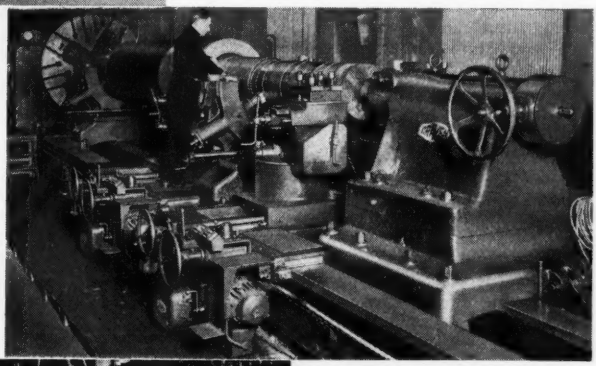
VISITORS to the Machine Tool and Engineering Exhibition at Olympia in London have an opportunity of studying a most comprehensive collection of machines and accessory equipment, representative of over 200 manufacturers. The exhibition (26th August to 11th September) was organized under the auspices of the Machine Tool Trades Association and is the first of its kind since 1934.

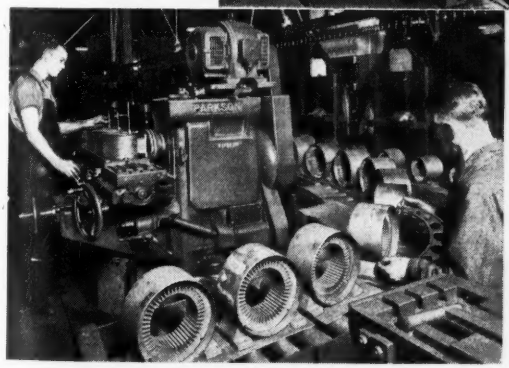


Pultra series 17 lathe

Many foreign machines are to be seen, the American makes being particularly in evidence. One of the most interesting of the American exhibits is the Bryant high-frequency grinding machine. Working from a 1,500-c/s supply the driving motor runs at 90,000 r.p.m., the various wheelheads being attached to the spindle. The diversity of British equipment ranges from the miniature lathe as used in the manufacture of instruments to the large types which are equipped with multiple-motor drive and are finding considerable application in the manufacture of heavy electrical machinery.

Among the small precision lathes are the exhibits of Pultra, Ltd., of which the series 17 is typical. This machine, which has a centre height of 50 mm and a distance between centres of 9·5 in., is truly versatile as it is provided with alternative lathe beds, headstocks, tailstocks and slides. The so-called "basic units" are interchangeable, thus providing a combination for almost any purpose.



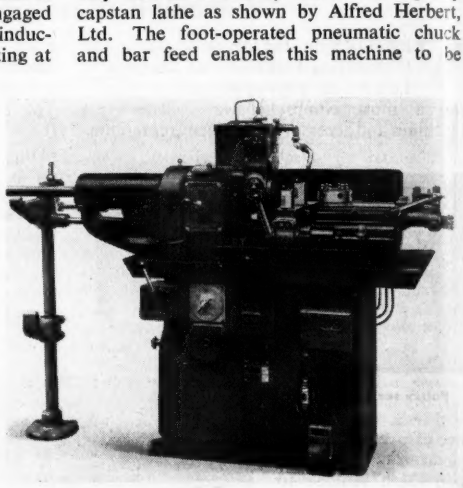


Above: Turning a turbo-alternator rotor at Stafford on a 42·5-in. Craven lathe. Left: Preparing induction motor stators on a Parkinson milling machine

As a typical example of the opposite extreme the adjacent illustration shows a lathe of Craven manufacture, which is in process of turning the rotor of a large turbo-alternator at the Stafford works of the English Electric Co., Ltd. It has a centre height of 42·5 in., and a maximum distance between centres of 45 ft.

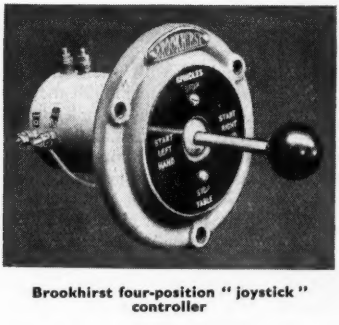
Another good example of electrical use which we illustrate is the milling machine by J. Parkinson & Son installed in the works of Crompton Parkinson, Ltd., and engaged upon the machining of medium-small induction motor stators. It may be interesting at this point to refer back to the *Electrical Review*, 20th August, 1948, page 277, where a description is given of the new Crompton Parkinson high-slip induction motor which has been specially designed for driving touch-operated machine tools.

Because a period of fourteen years has elapsed since the last exhibition there will be a tendency to under-rate or take for granted, some of the striking developments which have been made during that period. In fact progress has been such that the technique associated with machine tool design has changed materially, even if comparison be made with the designs existing at the outbreak of war, when an exhibition was to have been held.



Herbert 0·5-in. capstan lathe

There is an increasing use of electrical and other devices to give stepless and continuously variable driving speeds over wide ranges so that the optimum cutting speeds can be used for widely differing materials and purposes. Considerable attention also seems to have been paid to the grouping and simplification of machine controls in order to create easier working conditions. Electric drive practice has greatly improved and nowadays the motor is incorporated as an integral part of the machine instead of being placed in some peculiar and awkward position as though it were an afterthought. These features are very well illustrated by the 0·5-in. capacity capstan lathe as shown by Alfred Herbert, Ltd. The foot-operated pneumatic chuck and bar feed enables this machine to be operated continuously without moving the hands from the capstan slide and cut-off levers, resulting in very high production.



Brookhirst four-position "joystick" controller

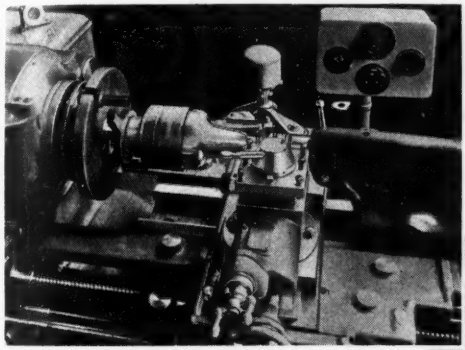
An example of built-in construction is the equipment controlling a 1-h.p. motor driving a milling machine made by Central Tool Equipment, Ltd. This apparatus employs a magnetic amplifier with thyratrons to give speed control up to 1,000 r.p.m. by armature voltage variation and from 1,000 to 3,000 r.p.m. by field control. The automatically compensated armature voltage is used as a measure of speed on this installation, but a tachometer generator is coupled to the motor to supply a small speed indicator on the control unit. Current limit and full field interlock are included and there is provision for reversing by means of a manually operated switch, which is protected by a removable cover against unauthorized use.

A machine of interest from the aspect of control facility and ease of operation is the 13-in. swing lathe for tool-room work shown by Dean, Smith & Grace, Ltd. This machine has twelve spindle speeds which are achieved by means of three mechanical gears in combination with a four-speed induction motor.

The rapidly developing science of servo-control, associated with electronics, is now coming into more frequent use for the auto-

matic control of industrial machinery and because of the extreme flexibility of this type of equipment, it is likely to assume a role of major importance in the future of machine tool design. Some machines embodying this system of control are provided with a single push-button pendant giving complete control over all operations.

The almost unlimited possibilities of electrically operated control systems are illustrated by such exhibitors as George Ellison, Ltd., and the Igranic Electric Co., Ltd. For example, amongst a representative selection of control accessories, Brookhirst Switchgear, Ltd., are demonstrating the method of obtaining continuously variable speed control over a d.c. motor by utilizing a grid controlled mercury arc rectifier. Another good illustration of this method of control is represented by the 24-in. swing



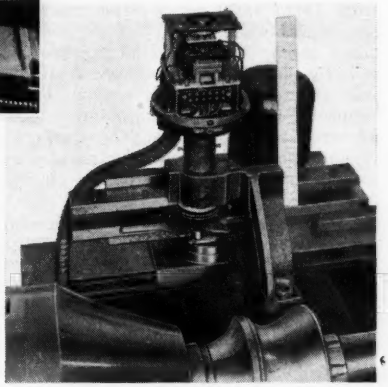
Metro-Vick automatic contouring equipment: the " close-up " showing electromagnetic stylus, template and pick-up unit

lathe on the stand of George Swift & Sons, Ltd. This machine is equipped with a comprehensive array of controls and instruments indicating cutting speed and speed of driving motor, etc., as its primary use is in experimental work on new tool steels.

Apart from machines, some of them being improved models of existing types, which are familiar to production engineers, completely new designs and prototypes are on view. One of the most interesting of these is a " Genoptic " profile grinding machine made by Taylor, Taylor & Hobson, Ltd., which combines the advantages of mechanical generation with those of copying by optical projection and may be operated either manually or by means of a servo system.

Among the large machines shown by John Lang & Sons is a 20-in. swing lathe for surfacing and screw-cutting which is unusual in that it embodies electronic equipment enabling it to perform automatic contour copying. An electromagnetic follower is mounted on the cross slide of the machine in such a way that a sensitive stylus makes contact with a template situated behind the saddle. Movement of the stylus is converted into an electrical signal and amplified to control the speeds of the two feed motors.

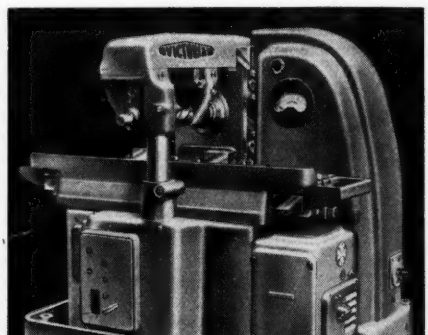
Automatic contouring equipment for reproducing irregular shapes in repetition machining forms one of the major exhibits of the Metropolitan-Vickers Electrical Co., Ltd. Its operation depends upon an electromagnetic stylus following the edge of a template, which, through an amplifier regulates two small d.c. motors geared to the cross and longitudinal feed screws. The continuous variability of the feed-motor speeds gives smooth movement of the tool, resulting in fine accuracy and finish. A feature of this machine is that the stabilizing arrangements give complete independence of such variables as friction and load. An interesting demonstration of this is made with the application of the control



to a motor fitted with a speed indicator. The exhibit is so arranged that visitors may vary the load and speed to test the efficiency of regulation of the drive.

On the same stand may be seen a 6-ft high-speed boring mill of George Richards & Co., Ltd., the 40-h.p. driving motor of which

is supplied through a glass-bulb mercury arc rectifier with a separate hard valve amplifier in its grid control circuit. Speeds up to 750 r.p.m. are obtained by armature voltage variation and from 750 to 1,500 r.p.m. by field control. Control over the whole range is provided by a single knob. Current limit and dynamic braking are included and constant cutting speed can be maintained over a wide range of work diameter with motor speeds between 300 and 1,500 r.p.m. using an automatic speed controller governed by the tool position.



Elliott " Victomatic " plain milling machine

A hexagon turret lathe exhibited by Alfred Herbert, Ltd., is suitable for bar work up to 3 in. in diameter by 38 in. long. It has a " Preoptive " headstock and the two-speed driving motor provides sixteen spindle speeds from 13 to 1,000 r.p.m. This machine is shown with the bar feed and double-toggle chuck arranged for electrical operation. It is likely that the electrically operated chuck will to some extent overcome loading problems. The power consumption is low as current passes only during the opening and closing operations. The mechanism is self-locking and centrifugal force has no effect upon the jaws.

The main feature of a plain milling machine among the exhibits of B. Elliott & Co., Ltd., is that it can be operated either manually or automatically with equal facility. Power for the main drive is provided by an 8-h.p. motor and there are twenty spindle speeds from 30 to 1,100 r.p.m. An ammeter flush mounted in the column, measures the main motor current and indicates when cutter regrinding is necessary.

A hydraulically operated universal grinding machine made by John Lund, Ltd., normally incorporates a variable speed driving motor with an a.c. commutator and induction regulator to give a speed range of 10 to 1. The model exhibited is equipped with electronic motor controls, an advantage of which is that the smallness of the control elements enables them to be built into the control box within easy reach of the operator.

Examples of both dielectric and induction heating equipment are shown by Wild-Barfield Electric Furnaces, Ltd. An induction heater exhibited for the first time, has an output of approximately 1 kW at 1 Mc/s and may be used for surface hardening, soldering and brazing small articles on the production line. The induction heating equipment shown by Birlec, Ltd., Tyburn Road, Erdington, centres upon a small working model of a rotary type continuous billet heating machine for large production requirements. Twelve full-size units of this type are at present being built on a production basis for a large forging installation to handle an output of 10 tons an hour. This installation will be one of the first of its kind and one of the most advanced forging plants in the world. Other industrial radio-frequency heating equipment is to be seen on the stand of Philips Electrical, Ltd., together with a selection of magnetic filters and skimmers.

Among the welding equipment at Olympia is a universal seam welding unit of Sciaky manufacture capable of longitudinally or circumferentially welding added thicknesses of 14 + 14 s.w.g. It has a nominal rating of 50 kVA and is demonstrated in conjunction with a B.T.H. electronic control unit.

Electrodeposition Conference

THE proceedings of the International Electrodeposition Conference, which took place in London last year, are now available as a bound volume of 218 pages containing 24 illustrated papers with discussions, bibliographies and list of delegates. Copies can be ordered, price £2 10s. 0d. to non-members, from the Electrodepositors' Technical Society, 27, High Street, Islington, London, N.1.

COMMERCE and INDUSTRY

Anglo-American Council. European Television Market.

THE British side of the Anglo-American Council on Productivity has now been constituted and it held its first meeting on 25th August. The F.B.I. representatives include Sir Frederick Bain (president) and Sir Peter Bennett, chairman of Joseph Lucas, Ltd. Among the T.U.C. representatives is Mr. J. Tanner of the Amalgamated Engineering Union. The joint secretaries are Mr. Vincent Tewson, general secretary, T.U.C., and Sir Norman Kipping, director-general of the F.B.I.

The objects of the Council as formulated at the meeting are "to exchange views on the question whether there are ways through E.R.P. and otherwise in which United States industry could co-operate in assisting the efforts of British industry to promote greater efficiency, and to facilitate any necessary arrangements to that end."

Census of Distribution

Early in July the President of the Board of Trade appointed the Census of Distribution Advisory Committee to advise on the preparation of the forms and instructions necessary for the taking of the first national census of the distributive and service trades, covering trading in the year 1949. At its first meeting the Committee decided that, in view of the special problems associated with the wholesale trades, a sub-committee, drawn from the various branches of these trades, should be set up. The sub-committee is under the chairmanship of Mr. J. Stafford, Director of Statistics to the Board.

Bombay Mill Lighting

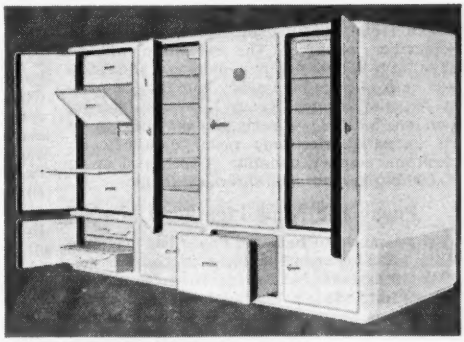
Following discussions when an Indian Government representative visited this country, the British Thomson-Houston Co., Ltd., undertook to supply equipment for the installation of a model lighting system in an Indian mill. With the co-operation of the Bombay Dyeing & Manufacturing Co., Ltd., an installation has been completed which demonstrates the advantages of fluorescent lighting. An area in the loom shed of the mill is lighted by sixty B.T.H. fluorescent fittings, each accommodating two 80-W lamps, and it is possible to compare side by side the effects of fluorescent and tungsten lighting. Information is required on the effect of the new lighting on output, working conditions, accidents, attendance, cleanliness of machines, and working space and of weaving costs and maintenance charges balanced against capital expenditure. Accordingly it is proposed to operate the model fluorescent lighting under normal working conditions in the mill for about six months, during which the equipment and its performance will be observed at about weekly intervals and careful records will be kept. Ultimately, it is hoped that the results of these observations will be made available for the benefit of all concerned with the operation of textile mills.

Diesel Locos for Victoria

The Australian Prime Minister has informed the Government of Victoria that it will have to abandon plans for the purchase of eighteen American diesel-electric railway locomotives because of the dollar shortage. Victoria, he says, is not alone in its requirements for locomotives; South Australia wanted ten and New South Wales was also interested, but the dollars could not be spared. The Victorian Government had considered using British-made engines but the American were found more suitable for Australian conditions.—*Reuter* (Canberra).

Gift to Princess Elizabeth

Last week the 130-cu ft refrigerator presented by members of the British Refrigerator Association to Princess Elizabeth as a wedding gift for installation at Clarence House was exhibited privately to members and friends at the E.L.M.A. Lighting Service Bureau. Described as being designed five years ahead of its time, the refrigerator has clean symmetrical lines and is finished outside in cream enamel to match the kitchen decoration scheme. In the centre is a 70-cu ft general storage compartment maintained at 40 deg F, a streamlined cooler attached



Princess Elizabeth's refrigerator

to the roof being equipped with a small fan to ensure even temperatures and correct humidity. Lighting is by fluorescent lamp switched on when either of the doors is opened. The 20-cu ft low-temperature section, kept at 30-40 deg below freezing point, is divided into four sub-sections each with its own self-sealing door behind the heavily insulated main door. Three of the sub-sections are storage compartments for quick-frozen food packages and the fourth is for the preparation and storage of frozen sweets, with provision for freezing 20 lb of ice cubes. A 30-cu ft game and poultry section is maintained at 36 deg F, and a fish compartment (capacity 140 lb of fresh fish) is kept at just above freezing point by refrigerant circulating round the walls in a new type of refrigeration system particularly suited to give correct humidity. Fruit and vegetables are stored in two drawers at the base. The refrigerator is operated by two hermetically sealed units of advanced design in a compact machine compartment which also houses the temperature controllers.

Electricity Output

In the week ended 20th August the output of sold-fuel fired generating stations was 710·7 million kWh, compared with 691·7 million kWh in the preceding week and 601·3 million in the week ended 22nd August, 1947. Stocks of coal at power stations at 21st August amounted to 4,042,600 tons (5·7 winter weeks' consumption).

Electronic Instrument Display

A trade exhibition of electronic instruments held recently in London by Cinema-Television, Ltd., is to be followed by a similar show at the Grand Hotel, Birmingham, from 20th to 24th September inclusive. The exhibition will be open from 10 a.m. to 6 p.m. daily and admission will be by tickets obtainable from the company at Worsley Bridge Road, Lower Sydenham, London, S.E.26. Among the exhibits will be an industrial electronic metal detector; an electronic counter, counting at speeds of up to 30,000 per minute; and three new oscilloscopes.

Pneumatic Mine-Lighting Units

The Minister of Fuel and Power has made the Coal Mines (Pneumatic Lighting Unit) Order, 1948 (S.I. 1948 No. 1918, H.M. Stationery Office, 1d.). This prescribes conditions for the use in mines of electric lighting units including a compressed-air-operated generator. It is laid down that no person other than one appointed in writing as a person competent to do so may dismantle or adjust these units. The Order replaces the 1938 Order dealing with the subject.

Trade with Chile

Under the recent Anglo-Chilean Agreement, Chile undertakes to accept inconvertible sterling for exports to this country. This provides a direct incentive to her to purchase her requirements from the United Kingdom. The Export Promotion Department of the Board of Trade points out that in the past there has been over-importation into Chile and it is not to be expected that present restrictions will be immediately relaxed. Therefore exporters should be sure that an import licence is obtained before an order is put in hand and, moreover, there should be a letter of credit before shipment.

America and European Television

The United States Radio Manufacturers' Association stated last week that America's television industry was "not particularly interested" in competing with Great Britain for European export markets at present. The huge domestic demand for television transmitters and receivers in the United States was not likely to be fully supplied until 1951. Until then, Britain might be allowed to have things "more or less its own way" in the export market. The opinion was expressed that Britain's 405-line transmission was inferior to the 525-line system.

The United States could certainly "outproduce" Britain in receiving sets, and offer them at a lower price, but it was admitted that if Britain's system should become generally established in Europe and elsewhere, United States manufacturers would find it difficult to "break in." The United States would probably produce nearly 800,000 sets this year, compared with the British industry's plan for 500,000 sets in the next three years.—*Reuter* (Washington).

Intercommunication Code of Practice

Telephone and telegraph (teleprinter) systems for intercommunication within buildings, or groups of buildings, or between distant buildings, by way of G.P.O. circuits are the subject of draft Sub-Code of Practice 327.101. Available systems are explained and main items of equipment described in detail; overall dimensions are given for the information of architects, and two appendices deal with the segregation of circuits, cables and wires. The Code is obtainable for 5s. from the British Standards Institution, 24, Victoria Street, London, S.W.1.

Oldhams' Progress

Last year the business of Oldham & Son, Ltd., was converted into a public company; now the company's history is told in an attractive illustrated brochure. The business arose out of a partnership between Joseph Oldham and Joseph Ward who ran a millwrighting and general engineering shop at Denton, Manchester, quite near the company's present works. The partners were later joined by Joseph Oldham's son, Orlando, and shortly afterwards Ward ceased to take an active part and the firm became "Oldham & Son."

There was a removal to larger premises and commencement of manufacturing, the firm's

products including felt-hat-making machinery, piston packings and steam dryers. The production of electric miners' lamps began early this century and with it the making of batteries and charging equipment. Starter battery manufacture proceeded from this and the company rapidly developed in this direction, at the same time keeping a firm hold of the hat-machinery business.

A photographic section of the brochure shows stage by stage the production of Oldham batteries and miners' lamps in a very graphic way.

Indian Import Control

The *Board of Trade Journal* for 28th August gives particulars of the Indian Government's arrangements for the control of imports during the latter half of this year. It is shown that among the items for which no import licences will be issued are electric lighting bulbs, house service type, 60-W and below ; bare copper wire ; electric table and ceiling fans and parts ; dry cells for torch batteries; and certain electrical earthenware and porcelain.

Among the items for which licences will be issued liberally are motors and generators of any type or design and component parts, other than motors from 1 to 30 h.p.; portable electric tools and parts; industrial exhaust fans and blowers; compressors, not being imported as an integral part of spray-painting, refrigerating or air-conditioning equipment, or as component parts of any engine; power driven pumps and parts, excluding trailer pumps; electrical control and transmission gear; flash-lights without cells; and machinery and component parts required for electricity supply undertakings.

South Eastern Electricity Board

From 1st September the address of the chairman, the secretary and the solicitor of the South Eastern Electricity Board will be 10, Queen's Gardens, Hove, 3, Sussex (telephone: Hove 9211).

Export Licensing Branch

From 13th September the headquarters of the Export Licensing Branch of the Board of Trade will be removed to: Regis House, King William Street, London, E.C.4 (telephone: Avenue 3111).

Trolley-bus Electrical Equipment

In London last week a documentary film was shown to representatives of the Transport Executive, called " The Heart of the Trolley-bus " produced by the Metropolitan-Vickers Electrical Co., Ltd. It began with a historical review of the development of public transport facilities up to the present-day trolley-bus. The manufacture of the driving motors was then described, followed by an explanation of the operation and construction of the control gear. The third section, which is also available as a separate film lasting ten minutes, dealt in detail with the maintenance of the electrical equipment mounted on a trolley-bus.

Fluorescent Lighting Installation

In a recent fluorescent lighting installation carried out at the modern factory of Yardley & Co., Ltd., at Stratford, E.15, 84 inverted trough reflectors are employed on one floor, utilizing 5 ft 80-W " daylight " fluorescent tubes. The reflectors are spaced at 10-ft centres throughout at a height of 6 ft above working plane. The manufacture, supply and installation was by H. W. Field & Son, Ltd., Cable Works, Harold Wood, Essex.

Section of the factory of Yardley & Co. showing fluorescent lighting installation

Lighting Economy in Cinemas

The cinema press reports that the proprietors of cinemas have been asked to dispense with the lighting of organ consoles and proscenium arches, decorative and advertisement lighting and exterior lighting other than that necessary for public safety and to avoid the use of power not essential to the operation of the cinema. These voluntary restrictions are for the period 1st October to 31st March.

New Company's Activities

Lloyds Engineering Companies, Ltd., whose registration was reported in last week's issue, has been formed to acquire financial interests in various manufacturing and trading concerns in electrical machinery, power plant, electrical domestic and medical appliances, and it will have departments dealing with rental, hire-purchase, maintenance, breakdown insurance,

machinery survey, inspections, repairs and constructional work. The chairman is Mr. A. G. A. Rainey, F.C.A., and the managing director Dr. F. Lloyd-Kessel, who has been associated for many years with the G.P.U. group of companies. The registered office of the company is at 6, Southampton Place, London, W.C.1, but it is intended to establish a combined central office.

Sweden Buys German Concerns

The Swedish Government has sanctioned the sale to a Swedish industrial concern, headed by Mr. Åke Wiberg, of the formerly German-owned Elektriska Aktiebolaget A.E.G. and its subsidiaries in Sweden. The *Anglo-Swedish Review* says that with the acquisition of A.E.G. interests in Sweden the country will now have two large concerns in the electrical field, the other being the A.S.E.A. The present annual turnover of the Swedish A.E.G. company is about 30 million kronor (£2 million).

Copenhagen Exhibition

It is announced that King Frederik of Denmark will open the British Exhibition in Copenhagen on 18th September and that the Duke and Duchess of Gloucester have accepted King Frederik's invitation to attend the opening ceremony. The exhibition, at which the products of more than 1,000 British firms will be displayed, is to continue until 3rd October.

Electrical Wholesalers

The Electrical Wholesalers' Federation has issued a revised (1948) edition of its list of members. This is arranged in two sections, one alphabetical and the other classified under towns.

Maintenance Engineer's Death

An unexplained burst of flame in a substation at Caplethill Road, Barrhead, caused the death on 20th August of Robert M'Stepney, and two other men were taken to hospital, one with serious burns. The men, employed by the South West Scotland Electricity Board, were engaged on a routine maintenance test.

Washing Machines for Argentina

We are informed that H. Fisher (Oldham), Ltd., makers of electrical domestic appliances have recently booked a very considerable order from a large Argentine concern.

The first part of this order consists of the supply of electric washing machines, to the value of $260,000, all to be supplied within the next year. The company also has in hand a large order for water heaters for South Africa.

Export Brochure

For circulation in overseas markets George Cohen, Sons & Co., Ltd., have produced a handsome illustrated brochure dealing with the activities of their group of companies. It covers the handling and supply of machinery and plant of many kinds; dismantling and demolition; steelwork; cranes; woodworking machinery; machine tools, etc. There are also pictures of the group's metallurgical and research laboratories at Letchworth. A similar publication, in condensed form, in French and Spanish, is being prepared.

Pye Works in Canada

Financial approval has been received by Pye, Ltd., to a scheme for the establishment by the company of a production plant at Ajax, Ontario. Premises are already available in the shape of a former Government works with a floor area of 15,000 sq ft on a five-acre site. The company proposes to produce electronic products, including radio and television sets suitable for the Canadian market.

Trade Publications

Crompton Parkinson, Ltd., Astor House, Aldwych, London, W.C.2.—Priced catalogue of industrial and commercial lighting equipment.

The Churn Company, Station Road, Hailsham, Sussex.—Leaflet illustrating electrically driven butter churns.

P. W. Allen & Co., Ltd., 1, Sunnyside, Muswell Hill, London, N.10.—Leaflet describing a fluorescent dental operating light.

Stokes Appliances, Ltd., 16, Dingwall Road, Croydon, Surrey.—Showcard concerning a table cooker and folder illustrating a range of cooking appliances.

Revo Electric Co., Ltd., Tipton, Staffs.—Three priced leaflets on twin-lamp fluorescent lighting fittings.

Telegraph Condenser Co., Ltd., North Acton, London, W.C.3.—Priced catalogue of electrolytic capacitors for a.c. motor starting.

Trade Announcements

The Edison Swan Electric Co., Ltd., 155, Charing Cross Road, London, W.C.2, is to undertake the sole distribution to the wholesale and retail trades of the radio components manufactured by the Plessey Co., Ltd., Ilford. A representative range of electrolytic condensers will shortly be marketed followed by other components, including wire-wound potentiometers, rotary and toggle switches, vibrators, etc.

Sound Rentals, Ltd., who have hitherto specialized in the hire-rental of Tannoy Products, have now arranged to take over the whole of the sales, installation and maintenance of these products.

As from 6th September the Edinburgh branch office of **B.I. Callender's Cables, Ltd.,** will be at 80/82, Hanover Street, Edinburgh.

Hampson Industries, Ltd., states that all correspondence should be addressed direct to its Sales Department at Arthur Street, West Bromwich (telephone: West Bromwich 0119).

Overseas Electrical Trade

RISE IN MOTOR EXPORTS

FROM a monthly average of £574,000 in the preceding three months, the value of exports of electric motors rose to £791,123 in July. Principal customers were India and Pakistan, £129,522 (against a monthly average of £17,920 in 1938) and New Zealand, £106,229 (£6,061 in 1938). Volume figures also show a substantial gain over pre-war, with a total of 2,118 tons for the month compared with an average monthly figure of 927 tons in 1938. For the seven months of the current year motor exports have amounted in value to £4,088,328 (11,498 tons), the comparable figure for 1938 being £1,015,317 (6,492 tons).

Table I.—Electrical Exports and Imports

Class	Exports			Imports		
	July, 1948	July, 1947	Monthly Av., 1938	July, 1948	July, 1947	Monthly Av., 1938
	£	£	£	£	£	£
Telegraph and telephone wires and cables (submarine)	2,311	103,392	17,289			
Ditto, not submarine	728,857	268,404	71,803			
Wires and cables, rubber insulated	610,498	512,621	117,533			
Ditto, cotton, silk or artificial silk insulated	97,770	54,631	†	17,181	6,006	31,246
Ditto, enamel, glass or asbestos insulated	32,433	23,655	†			
Ditto, paper insulated	685,699	317,096	103,457			
Ditto, other	84,124	125,376	49,799			
Commercial radio apparatus	251,340	128,004	28,296	47,936	28,017	58,018
Domestic radio apparatus	277,232	446,730	36,755			
Telegraph, telephone and signalling apparatus	1,129,188	655,366	242,716	11,835	6,248	9,243
Other radio, etc., apparatus	287,340	221,412	57,848	—	—	—
Radio valves	163,460	144,164	41,272	10,743	41,149	10,893
Electric carbons, furnace	*	*	*	32,522	110,545	4,054
Ditto, other	*	*	*	4,015	211	2,301
Electric lamps, not exceeding 24 V	27,047	14,604				
Discharge lamps	34,507	19,247	49,440	4,629	3,895	10,265
Other lamps	116,250	97,512				
Other lighting apparatus	527,969	316,330	48,565	5,001	12,141	38,662
Primary batteries	33,134	54,596	13,572	*	*	*
Accumulators for motor vehicles	150,577	134,759	16,418	*	*	*
Ditto, traction	6,311					
Ditto, radio	3,053	81,968	12,456	*	*	*
Other portable accumulators	25,610					
All other accumulators	62,095	23,302	19,773	*	*	*
Parts and accessories	54,078	38,848	—	*	*	*
Cooking apparatus and elements	150,724	118,373	16,600	*	*	*
Heating apparatus and elements	72,489	100,657	14,064	*	*	*
Other parts and accessories	29,655	32,215	—	*	*	*
Commercial electrical instruments	103,953	101,541	15,878			
House service meters	195,983	87,288	15,791	21,186	16,149	32,057
Other electrical instruments	85,078	104,363	9,612			
Electro-medical apparatus (not X-ray)	22,703	34,142	3,038	*	*	*
X-ray apparatus, tubes and parts	59,388	90,438	4,881	34,240	34,499	9,734
Insulating cloth and tape	50,577	48,059	7,038	*	*	*
Other insulating materials	95,131	84,741	12,305	*	*	*
Unclassified goods and apparatus	439,843	367,368	108,085	42,731	32,758	56,529
Generators, up to 200 kW	272,618	208,655	38,071	*	*	*
Ditto, over 200 kW	156,494	206,072	119,079	*	*	*
Ditto, parts	143,631	221,374	—	*	*	*
Motors, railway and tramway	3,765	—	15,977			
Ditto, other, up to ⅓ h.p.	117,500	36,822	9,001			
Ditto, from ⅓ to 1 h.p.	75,572	29,484	2,470	17,892	8,826	26,033
Ditto, from 1 to 250 h.p.	463,648	244,746	96,637			
Ditto, over 250 h.p.	79,041	45,660	20,960			
Ditto, parts	51,597	53,430	—			
Converting machinery	18,365	8,723	101,304			
Transformers, including coils	318,336	354,178				
Rectifiers for power house use	15,866	23,089	3,463			
Motor starting and controlling gear	133,331	88,000	50,866	30,467	252,394	14,455
Switchgear and switchboards (not telegraph or telephone)	807,321	437,778	184,533			
Other electrical machinery	28,165	30,398	15,497			
Vacuum cleaners and parts	138,688	368,903	26,662			
Other electrically-operated portable appliances	53,557	25,205	10,394	4,735	2,841	24,627
Total	9,573,902	7,333,719	1,829,198	285,113	555,679	328,117

* Not classified separately. † Not separately distinguished in 1938.

In the goods and apparatus section it is satisfactory to observe an improvement in exports of house service meters. So far this year 442,939 have been sent to overseas markets against 167,924 up to the end of July, 1947, and 96,446 in an equal period of 1938.

Table II.—Distribution of Exports of Electrical Goods and Apparatus

Destination	July, 1948	July, 1947	Monthly Av., 1938
	£	£	£
Eire	245,811	151,411	37,726
Channel Islands ..	30,719	51,581	12,177
Malta and Gozo ..	7,861	15,675	5,873
Cyprus	32,545	10,599	1,373
Palestine	22,459	105,125	8,426
British West Africa ..	130,949	54,306	12,889
Union of South Africa	920,109	564,288	162,384
Southern Rhodesia ..	79,206	47,322	9,632
British East Africa ..	49,501	80,036	7,893
India, Pakistan, etc.	911,672	742,090	123,789
British Malaya ..	136,820	146,335	32,792
Ceylon	57,098	46,621	15,048
Hong Kong	118,380	61,550	12,939
Australia	809,216	243,641	197,366
New Zealand ..	316,396	245,488	96,225
Canada	22,610	67,641	12,547
British West Indies ..	105,116	38,952	12,954
Anglo-Egyptian Sudan	12,590	17,047	2,989
Other British Countries	119,420	49,158	11,030
Soviet Union ..	92,399	42,567	36,781
Finland	48,748	22,282	5,969
Sweden	408,626	259,122	14,948
Norway	94,513	137,991	12,881
Iceland	21,381	10,678	2,796
Denmark	61,478	82,335	18,907
Poland	16,080	12,391	9,702
Netherlands	153,843	127,466	22,010
Belgium	86,352	95,997	11,208
France	51,803	24,822	16,082
Switzerland	48,993	27,995	3,768
Portugal	219,900	69,298	6,512
Spain	34,595	42,381	3,813
Czechoslovakia ..	45,071	17,146	7,205
Yugoslavia	3,393	16,357	1,475
Greece	69,026	79,375	4,926
Turkey	97,927	64,165	7,684
Dutch East Indies ..	23,547	73,128	2,692
Dutch West Indies ..	3,212	29,431	830
Portuguese East Africa	15,340	6,382	6,942
Lebanon	29,784	15,836	—
Egypt	184,126	127,913	13,176
Iraq	51,167	84,483	5,530
Iran	101,354	84,014	16,345
Burma	50,488	45,530	5,337
China	51,364	109,034	4,116
United States of America	19,363	5,256	5,839
Mexico	13,668	6,932	1,466
Colombia	17,090	9,627	845
Venezuela	36,673	45,845	2,936
Chile	14,133	24,163	6,635
Brazil	48,653	127,711	11,164
Uruguay	10,125	13,228	1,790
Argentine Republic ..	222,818	166,656	45,452
Other Foreign Countries	120,896	104,799	40,270
Total	6,696,407	4,951,202	1,134,284

Shipments of cables and telegraph and telephone equipment were again heavy, but exports of domestic radio receivers, after some recovery, relapsed to a level well below last year's.

Excluding Empire countries, the chief overseas market for electrical goods (other than machinery) last month was Sweden, with a value of £408,626. One of the biggest increases was in supplies to Portugal with a total for the month of £219,900 against £69,298 a year ago.

Electrical machinery exports at (£ million) 2·69 exceeded the end-1948 "target" of 2·40. In the case of goods and apparatus the month's figure was 6·70 compared with the 7·07 set for the end of the year; this figure includes wires and cables 2·24 (exceeding the target of 1·95), radio apparatus 0·98 (1·20), telegraph and telephone apparatus 1·13 (1·25) and lighting apparatus 0·71 (0·82).

Imports of electrical equipment, at £285,113, were less than in June (£328,117) and well below the July, 1947, total of £555,679). The United States remained the principal supplier of goods and apparatus (£84,924), followed by Canada (£42,420).

New Rolling Mill

Fastest Equipment of its Kind in the British Isles

A LARGE order for the electrical equipment of the cold strip rolling mill, five-stand tandem, which is to be installed in the Trostre Works (Llanelly) of the Steel Co. of Wales, Ltd., has recently been secured by the British Thomson-Houston Co., Ltd.

The electrical equipment for the finishing mill of the same company's 80-in. hot strip mill in the Abbey Works at Port Talbot (previously known as Guest, Keen & Baldwins) is also being made by the B.T.H. organization. A proportion of the product of this mill will be rolled down still further in the five-stand cold mill at Trostre, so converting it into thin-gauge material that will subsequently be tinned and then sheared into tinplate.

The new five-stand mill is of special interest on account of its speed (4,500 ft per min, or 51 m.p.h.) which will be three times the speed of the present fastest mill of its type in Great Britain the five-stand tinplate strip mill at Ebbw Vale of Richard Thomas-Baldwins, Ltd., which also has B.T.H. electrical equipment.

As a consequence of the high speed of the new Trostre mill, its output and the power needed to drive it will both be very great. The mill is to be driven by six d.c. motors, one for each stand and one for the winding reel, totalling 19,150 h.p.; they will energized by two large motor-generator sets. The motors have been so designed that their inertia will be very small in order to assist the rapid acceleration of the mill. Most of them will be double-unit machines, but a triple-unit motor will drive the fifth stand, which means in effect three motors solidly coupled together.

One of the duties of the new mill, quoted by "B.T.H. Activities" as an example of what it will do, will be to roll steel strip 36 in. wide by 0·008 in. thick which, upon issuing from the mill, will be wound on to a reel into a coil weighing about 13·5 tons and containing about six miles of strip. It is hoped to roll such a coil in a little over seven minutes.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

Central Electricity Board.—The British Electricity Authority has notified holders of the Central Electricity Board's 3½ per cent stock 1963-93 that as a question which has arisen regarding the exchange value of the stock has not been settled between the Minister of Fuel and Power and the stockholders' representative it will have to be determined by arbitration. In the meantime the stockholders are to receive (on 1st October) interest at the rate of 1¼ per cent of £113 for each £100 of the stock held.

The Northmet Power Co.—In accordance with the provisions of Section 27 of the Electricity Act, 1947, the final payment of dividend on the ordinary stock at the rate of 2¼ per cent for the period 1st January to 31st March, 1948, will be made on 1st September, 1948, to holders registered 31st March.

Pirelli-General Cable Works, Ltd., reports profits, after providing for depreciation, etc., for the year ended 31st March last of £1,236,559, as compared with £600,124 for the preceding year. Of this profits tax absorbs £716,585, general reserve receives £30,773, plant replacement £200,000 and stock reserve £150,000. The dividend for the year is 8 per cent, less tax, plus a bonus of 12 per cent, less tax (both unchanged).

Thorn Electrical Industries, Ltd., report a trading profit of £199,123 for the year ended 31st March last, less depreciation £59,526, directors' fees £13,500, audit £2,370 and taxation £71,108, leaving a net profit of £52,569 compared with £42,876 for the preceding year. It is proposed to pay an ordinary dividend of 25 per cent for the year (same).

The Ransome & Marles Bearing Co., Ltd., reports a net profit for the year ended 30th June last, after providing for depreciation and taxation, of £286,548, as compared with £205,959 for 1946-47, which with the balance brought in makes £366,305 available. General reserve receives £142,414 and pension fund £40,000. The final dividend is 12½ per cent, plus a bonus of 5 per cent, maintaining the distribution for the year at 25 per cent.

Brown Bros., Ltd., are paying an interim dividend of 5 per cent against 2½ per cent last year, the increase being made in order to achieve a better balance between interim and final dividends.

S. Guiterman & Co., Ltd.—In an interim report it is stated that the adverse factors mentioned in the chairman's statement for 1947 have increased. When the war caused the company's imports to diminish, a profitable trade was built up in certain lines of British manufacture. In the early part of the year there had been a falling off in buying which was then attributed to people waiting for information about the Budget proposals, but trade continued inactive and the decline in turnover had been severe. Purchase tax had crippled business in certain goods and the rises and falls in the tax were most detrimental to trade.

The Nigerian Electricity Supply Corporation, Ltd., reports that revenue for the year ended 29th February last amounted to £158,439 compared with £154,874 for 1946-47, the net balance being £68,887 (£65,299). Tax reserve receives £35,000 (£32,500), the dividend as already reported remains at 8 per cent with a bonus of 2 per cent, and £20,780 (£16,868) is carried forward.

Oldham & Son, Ltd., propose to pay a final ordinary dividend of 30 per cent, making 60 per cent for the year (unchanged). Net profits before tax for the year ended 31st May last amounted to £224,000, compared with £145,000 for 1946-47. Tax reserve receives £94,000 (£46,000) and there is £40,000 (nil) appropriation to reserve.

The Automatic Telephone & Electric Co., Ltd., has declared an interim dividend of 3 per cent (unchanged).

New Companies

Newstet Refrigeration Co., Ltd.—Registered 21st August. Capital, £5,000. Manufacturers of, dealers in and hirers of, refrigerators, generators of power and electricity for refrigeration, etc. First directors: W. Pendleton and W. A. Pendleton. Regd. office: 1-3, Stanley Street, Liverpool, 2.

S. C. Ingram, Ltd.—Registered 20th August. Capital, £6,000. Manufacturers, repairers and hirers of accumulators, batteries, radio and television sets and electrical equipment, etc. Directors: S. C. Ingram (secretary) and R. Nicholson. Regd. office: 92-4, Albert Street, Grimsby.

Ceramic Components, Ltd.—Registered 20th August. Capital, £3,000. Manufacturers, importers and exporters of, and dealers in, ceramics, electrical fireclay products, etc. Directors: T. A. Roberts and E. J. Rogers, Boscombe House, Thorpe Lea Road, Egham, Surrey.

Electrical Re-Wind and Repair Service (Birmingham), Ltd.—Registered 23rd August. Capital, £1,000. To acquire the business carried on by John W. Jones as Electrical Re-Wind and Repair Service at 1, Great Tindal Street, Ladywood, Birmingham, 16, and to carry on the business of electrical engineers, electric motor manufacturers, coil winders, etc.

Directors: J. W. Jones, S. E. Jones and J. Jones. Secretary: J. Yeomans. Regd. office: 1, Great Tindal Street, Ladywood, Birmingham, 16.

Increases of Capital

Micanite & Insulators Co., Ltd.—Increased by £300,000, in 50,000 ordinary and 250,000 unclassified shares of £1 each, beyond the registered capital of £200,000. On 16th April, 1948, Associated Electrical Industries, Ltd., held 22,857 ordinary and 55,714 preference shares, the English Electric Co., Ltd., 1,429 ordinary and 12,857 preference, and Associated Insulation Products, Ltd., 75,714 ordinary and 31,429 preference.

Manchester Insulating & Electrical Co., Ltd.—Increased by £19,000, in £1 shares, beyond the registered capital of £1,000. (Originally Moores (M/C), Ltd., renamed Manchester Insulating Co., Ltd., and again renamed as above.)

Dome Refrigeration, Ltd.—Increased by £1,000, in £1 5 per cent cumulative preference shares, beyond the registered capital of £3,000.

Meeting of Creditors

Charlton Electrical Appliances, Ltd.—Meeting of creditors on 21st September at the Leicestershire Trade Protection Society, Ltd., 4, New Street, Leicester.

Liquidations

British Made Electrics, Ltd.—Winding up voluntarily. Liquidator, Mr. D. Morgan, 19, St. Martin's Street, London, W.C.2.

Marconi-E.M.I. Television, Ltd.—Members' voluntary winding-up. Particulars of claims by 30th September to Mr. T. Howarth, 3, Frederick's Place, Old Jewry, London, E.C.2.

Precision Resistors, Ltd.—Members' voluntary winding-up. Liquidator, Mr. S. A. Letts, Craig's Court House, 25, Whitehall, London, S.W.1, appointed 13th August, 1948.

Bankruptcies

T. Williams, trading in co-partnership with G. Williams, now deceased, at 31a, Walsall Road, Willenhall, and 2, Lower Lichfield Street, Willenhall, as Geo. Williams & Son, electrical engineers and contractors.—Last day for receiving proofs for dividend 11th September. Trustee, Mr. R. K. Clark, Somerset House, 37 Temple Street, Birmingham, 2, Official Receiver.

W. Millis, electrical engineer, lately carrying on business at 278, Archway Road, Highgate, London.—Receiving order made 18th August, 1948, on a creditor's petition.

A. Lawson, electrical engineer, 261, Park West, Edgware Road, London, W.1.—First and final dividend of 1s. 1¼d. in the £ payable 10th September at Bankruptcy Buildings, Carey Street, London, W.C.2.

Australian News

(From a Correspondent)

IT is reported by the Sydney County Council that during 1947 there was a 12·17 per cent increase in the sale of power, the largest increases being in commercial sales (21·79 per cent) and in bulk sales (16·79 per cent). Mr. G. S. Boyd, general manager states that as building activity increases and more apparatus comes on the market, a still greater increase in power sales can be expected.

New Cable Company.—Austral Standard Cables Pty., Ltd., has been registered with a capital of £1,000,000 to manufacture cables and electrical goods. Its offices are in Melbourne. Among other new companies is Hoover (Australia) Pty., Ltd., Sydney, with a capital of £100,000, which will take over from John S. Drysdale, Ltd., the handling of all Hoover products in the Commonwealth.

Price "Ring" Alleged.—The chairman of the Sydney County Council (Councillor J. O. Cramer) alleges that there is a "ring" which fixes the price of many electrical goods. He suggests that one way to break up such a ring is to allocate a share of orders to all tenderers. Another way is to pick out a few firms which give reliable service and give them all the orders. The statement was made when the question of tenders for approximately £180,000 worth of cables was being considered.

Advisory Committee on Materials.—A committee to act in an advisory capacity in the matter of electrical materials approvals in South Australia has now been formed, the members being: Chairman, Mr. F. G. Giles (Electricity Trust); vice-chairman, Mr. G. H. Machin (Electricity Trust); committee, Messrs. W. G. Gerard (Chamber of Manufactures), L. Smith (Electrical Merchants' Association), F. R. Mayfield (Electrical Development Association), W. H. Hobbs (Fire Underwriters' Association), P. W. Trevorrow (Electrical Trades Union) and R. C. Lewis (Electricity Trust).

Insulators from Japan.—An officer of the Victorian State Electricity Commission is shortly to visit Japan to obtain insulators for electricity extensions in that State. The Minister for Electrical Undertakings (Mr. Lienhop) states that the shortage of insulators is so acute that miles of extensions remain unfinished. Lack of insulators is also delaying the manufacture of transformers.

Newcastle Transport Services.—Because of the impossibility of purchasing the undertaking at a reasonable figure, the Greater Newcastle City Council (N.S.W.) has abandoned its plan to acquire the city's transport services. Track and tramway rolling stock, said to be both hopelessly worn out, were valued at £363,836 and £145,555 respectively, and accumulated deficits total £376,000.

STOCKS and SHARES

INDICATIONS are not wanting that the holiday calm of Stock Exchange business is giving way to a more interesting state of affairs. There is nothing more boring than to stand idle in the markets, finding next to no business with which to occupy the tedious hours. But there is at length a breath of occasional animation in the House, and after the heavy falls suffered during July most of the markets now exhibit a hardening tendency. Gilt-edged stocks continue to advance. Radio shares are on the rise. Investment inquiry is increasing, and, in the absence of foreign shocks, will probably materialize into practical support to markets as the holiday season draws to its end.

The Month's Changes

The catalogue of changes in July showed a dismal list of falls. There were, in fact, only four rises against 71 declines. August, however, has brought some little compensation, and improvements are in the majority. Cable & Wireless ordinary stock has gained 8½ points, Oriental Telephones are 10s. higher. Numerous advances of 2s. 6d. appear in the lists. Thomas Tilling have once more reached 101s. 6d. and Lancashire Dynamos rose to the level £5. General Electrics are 4s. 6d. higher at 85s. 9d. Arons at 50s., Crompton Parkinsons at 26s. and Tube Investments at 6 3/16 have all gone ahead. On the other hand, Associated British Engineering are down 7s. 6d. at 32s. 6d. and the Anglo-American Telegraph stocks have gone back several points on further deferment of the dividend payment, while the weakness of the New York Stock Exchange is reflected in a drop of $4, to 20, in International Telephone & Telegraph.

Radio and Television

During the last week or so, more attention than usual has been directed to the shares of the leading radio companies, speculation for the long term being evidently intrigued by the prospects which open, more particularly perhaps for the television branch. Shares such as E. K. Cole, Cossor, Electrical & Musical and Pye, to mention four well-known undertakings, have been in active request, and the prices are decidedly better on the month. It would seem as though the television cult is certainly growing; the recent lowering of the purchase tax means additional support to the industry at large. Of still greater importance is the official assurance that the present system is not to be changed for some years. This particular section of the market attracts increasing notice, as the improvement in prices serves to demonstrate.

Manufacturing and Equipment

" General conditions " is a phrase which has to cover a good many Stock Exchange price developments at the present time, and to this cause must be attributed the comparative quietude which characterizes the markets, amongst them the group of shares in the electrical manufacturing and equipment section. The investor finds it difficult to obtain more than 4¼ per cent from ordinary shares in such companies as W. T. Henley's, British Insulated Callender's, General Electric and Associated Electrical, to mention a few in this class. The security of the shares is the attraction which explains the steadiness of the prices, and serves to attract money for which safety first is a main consideration. Maintenance of the dividends on shares of this nature is commonly assumed in the market as being certain, at all events for a long time ahead. The volume of business which these companies are doing is regarded as being secure for years to come.

Automatic Telephone

Announcement of an interim dividend of 3 per cent by Automatic Telephone & Electric Co., Ltd., carries on a similar rate which has been declared for many years, and which has been followed by a final dividend and bonus of 9½ per cent, making 12½ per cent for the year, since 1938 inclusive. At the present price of 63s. 9d. the return on the money is a shade under 4 per cent, on the basis of the 12½ per cent dividend. Of ordinary capital, there is issued £684,379 in £1 units. In addition, 100,000 " A " deferred shares of £1 are all held by British Insulated Callenders Cables. There are also 260,000 " B " deferred stock units of £1, which receive 12½ per cent dividends, and which stand about 6s. per share lower than the ordinary. On the former the yield is £4 6s. 2d. per cent. The deferred stockholders cannot vote at a general meeting, and their dividend, distributed only once a year, is dependent upon that paid on the ordinary shares.

Preference Shares and Dealing Expenses

Reference was made here, on 16th July, to the discouraging effect upon Stock Exchange business of the high cost of investment in ordinary shares, due, largely, to the 2 per cent transfer stamp on purchases. Applied to preference shares, the matter becomes more pointed in comparison with the terms for dealing in stamp-free gilt-edged stocks. As an example, the 4 per cent preference stocks of some of the leading electrical companies are on offer at about 22s. 6d., yielding a shilling over 3½ per cent. On 100 shares at 22s. 6d., the buyer pays £3 15s. 0d. in transfer stamp and brokerage. His gross dividend for a full year amounts to only 5s. more, and is reduced to £2 4s. 0d. by tax at the standard rate. That is, it takes about 20 months' interest to cover the expenses of dealing. On the other hand, the buyer of gilt-edged stocks pays no stamp duty at all, and a lower rate of Stock Exchange commission. New issues provide, of course, the opportunity to acquire shares free of stamp, thereby avoiding more than half the expenses.

Electrical Investments

Past Month's Price Changes

Company	Dividend Previous	Dividend Last	Middle Price 30 Aug. 1948	Month's Rise or Fall	Yield p.c.
Overseas Electricity Companies					£ s. d.
Atlas Elec. ..	Nil	2	14/–	..	2 17 2
Calcutta Elec. ..	6†	6†	35/9	– ⅛	3 7 0
Cawnpore Elec...	13	13	40/–	– 5/6	6 10 0
EastAfricanPower	7	7	43/6	..	3 4 3
Jerusalem Elec...	5	6	21/–	..	5 14 3
Madras Elec. ..	8	5	37/6	+½	2 13 2
Nigerian Elec. ..	12½	10	34/–	..	5 17 8
PalestineElec."A"	7†	7†	33/6	–1/–	4 3 7
Perak Hydro-elec.	Nil	Nil	13/–	..	—
Tokyo Elec. 6% .	—	—	42½	+1	—
VictoriaFallsPower	19½	19½	7 7/16	+ 1/16	—
WhitehallInv.Pref.	—	6	25/6	..	4 14 1
Equipment and Manufacturing					
Aron Elec. Ord...	15	15	50/–	+½	6 0 0
Assoc. Brit. Eng.	12	12	32/6	–7/6	7 7 8
Assoc.Elec.Ord...	15	15	72/6	+ ⅛	4 2 8
AutomaticTel.&El.	12½	12½	63/9	..	2 18 7
Babcock & Wilcox	15	15	67/–	+ ⅛	4 9 7
Baldwin,H.J.(2/–)	25	25	9/9	+3d.	5 2 7
British Aluminium	10	10	47/3	..	4 4 9
B.I. Callender's..	6¾	6¾	33/6	+6d.	3 19 6
British Rola (2/–)	15	10	1/3	+3d.	—
BritishThermostat (5/–)	23½	23½	25/9	..	4 11 3
BritishVac.Cleaner (5/–)	20	20	12/3	–9d.	8 3 4
Brush Ord.(5/–)..	—	—	6/–	..	—
Burco (5/–) ..	35	35	23/9	..	7 7 4
ChlorideEl.Storage	20	20	95/–	..	4 4 2
Cole, E. K. (5/–)..	20	22½	15/6	+3/–	7 5 2
Cossor, A. C. (5/–)	25	Nil	10/9	+2/3	—
Crabtree (10/–) ..	17½	17½	41/6	+3d.	4 4 4
CromptonParkinson Ord. (5/–) ..	22½	22½	26/–	+2/–	4 6 7
De La Rue (5/–)	50	50	39/6	..	6 6 7
Decca (1/–) ..	112½	112½	19/–	..	5 18 5
E.M.I. (10/–) ..	8	6	18/9	+2/3	3 4 0
Elec. Construction	12½	12½	48/9	..	5 2 6
Enfield Cable Ord.	7½	7½	33/9	+ ⅛	4 8 9
English Electric .	10	10	45/ 9	+9d.	4 7 4
Ericsson Tel. (5/–)	20†	20†	43/3	..	2 6 4
Ever Ready (5/–)	40	40	36/–	–6d.	5 11 0
Falk Stadelmann	10	15	41/3	– ⅛	7 5 8
Ferranti Pref. ..	7	7	35/–	..	4 0 0
G.E.C. Ord. ..	17½	17½	85/9	+4/6	4 7 5
GeneralCables(5/–)	25	50	37/6	..	6 13 4
Greenwood&Batley	15	15	52/–	..	5 15 5
H.T.A. (10/–) ..	10	10	13/9	..	7 5 6
Heatrae (2/–) ..	12½	12½	5/–	..	5 0 0
Henley's (5/–) ..	20	20	24/–	+6d.	4 3 4
Hopkinsons ..	22½	22½	95/–	..	4 14 6
Intl. Combustion (5/–)	37½	37½	40/–	..	4 14 9
Johnson & Phillips	15	15	67/–	+1/–	4 9 7
LancashireDynamo	22½	22½	100/–	+½	4 10 0

Company	Dividend Previous	Dividend Last	Middle Price 30 Aug. 1948	Month's Rise or Fall	Yield p.c.
Equipment and Manufacturing *(Continued)*					£ s. d.
Laurence,Scott(5/–)	12½	12½	13/6	..	4 12 7
London Elec.Wire	10	10	45/–	..	4 9 0
Mather & Platt ..	11	11	51/3	+6d.	4 5 9
Metal Industries(B)	10	10	43/3	–6d.	4 12 4
Mid. Elec. Mfg. ..	35	35	8½	..	4 5 0
Murex	20	20	86/3	..	4 13 0
Newman Ind.(2/–)	22½	22½	7/–	..	6 8 7
Plessey (5/–) ..	30	20	12/6	–½	8 0 0
Parsons C. A. ..	12½	12½	60/6	+6d.	4 2 9
Pye Deferred (5/–)	25	25	22/6	+½	5 11 0
Radio & Tel. (2/–)	40	—	5/–	+6d.	—
Revo (10/–) ..	27½	27½	58/–	..	4 14 9
Reyrolle	12½	12½	61/3	+ ⅛	4 1 8
Scophony (5/–) ..	—	—	2/–	..	—
Siemens Ord. ..	7½	7½	32/6	+6d.	4 12 4
Strand Elec. (5/–)	12½	17½	9/6	..	9 4 2
Switchgear&Cowans (5/–) ..	10	20	16/6	..	6 1 3
T.C.C. (10/–) ..	15	15	32/6	..	4 12 4
T.C. & M. ..	10	10	44/3	–9d.	4 10 6
Telephone Mfg.(5/–)	9	9	9/3	..	4 17 3
Thorn Elec. (5/–)	20	25	18/9	..	5 6 8
Tube Investments	22½	25	6 ⅛	+ ⅛	4 1 0
Vactric (5/–) ..	Nil	Nil	5/–	– ⅛	—
Veritys (5/–) ..	2½	5	4/–	..	6 5 0
WalsallConduits(4/–)	70	70	55/–	+9d.	5 1 10
Ward & Goldstone (5/–)	50	50	57/6	..	4 6 10
Watford (2/–) ..	15	15	5/3	..	5 14 3
WestinghouseBrake	14	14	62/6	..	4 9 7
West, Allen (5/–)	10	10	9/9	..	5 2 7
Transport and Communications					
Anglo-Am. Tel.: Pref.	6	6*	120½	–4½	—
Def.	1½	1½*	22½	–2½	—
Anglo-Portuguese	8	8	32/–	+6d.	5 0 0
Brit.Elec.Traction: Def. Ord. ..	50	50	1600	–35	3 2 6
Calcutta Trams..	10	Nil	29/6	..	—
Cape Elec. Trams	6	6	32/6	..	3 13 10
Cable & Wireless : 5½ Pref. ..	5½	5½	124½	+2	4 8 4
Ord.	4	4	194	+8½	2 1 3
CanadianMarconi$1	Nil	4 cts.	11/3	– ⅛	—
Globe Tel. & Tel.Ord.	5†	5†	42/6	..	2 7 0
GreatNorthernTel. (£10)	15	12	22½	+½	5 6 8
Inter. Tel. & Tel.	Nil	Nil	20	–4	—
Marconi-Marine..	7½	7½	30/6	–1/6	4 18 3
Oriental Tel. Ord.	4	10	55/–	+10/–	3 12 9
Telephone Props.	6	6	17/6	– ⅛	6 17 2
Tele. Rentals(5/–)	10	10	10/9	..	4 13 0
T. Tilling ..	10	10	101/6	+½	1 19½ 3

* Dividend postponed.

† Dividends are paid free of Income Tax.

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Electricity Supply

Area Tariff Charges. New Australian Station Planned.

Alderley Edge.—SUCCESSFUL DEVELOPMENT.—In an epilogue to the last annual report of the Alderley Edge and Wilmslow Electricity Board, Mr. J. P. Heslop says that the Board and five others were to some degree models for the new authorities which had been set up. In the eighteen years of the Board's existence the number of consumers had increased fourfold and energy sold nearly thirty times. By the end of the year under review the average number of kWh sold per consumer had reached 3,179 per annum.

Eastern Area.—ELECTRICITY CHARGES.—In a statement issued by the Eastern Electricity Board it is said that only eleven former undertakings out of a total of thirty-nine will be affected by the raising of the running charges of two-part tariffs to ¾d. per kWh and in some of these districts the increases will be of a minor character only.

Edmonton.—BOARD TO WIRE HOUSES.—The Borough Council is to enter into a contract with the Eastern Electricity Board for the electrical installations in sixty houses on the Cuckoohall Housing Estate.

Gateshead.—STREET LIGHTING.—The Ministry of Transport has authorized the carrying out of the first stage of the conversion of street lighting to electricity at a cost of £15,000.

Grassington.—FIXED CHARGE REDUCED.—Following a complaint from a consumer, the Yorkshire Electricity Board has informed Mr. G. B. Drayson, M.P. for Skipton, who took up the matter, that the fixed charge for domestic electricity consumers in Upper Wharfedale is being reduced from 1st September.

Kent.—WORK AT INSTITUTION.—The County Council Public Assistance Committee recommends expenditure of £18,595 for the carrying out of works of adaptation to the Cranbrook Institution. Of this sum £2,900 is in respect of lighting and power installations, including service cable and rewiring laundry machinery, and £1,000 for the installation of radio, telephones, and fire alarm system.

SUPPLY TO SCHOOLS.—The Education Committee reports that agreement has been reached with the South Eastern Electricity Board, for improving the electricity supplies to schools in the Bexley area, involving the erection of substations at nine schools.

Oldham.—STREET LIGHTING CONVERSION.—Two miles of lighting of Huddersfield Road from Mumps to Waterhead, have been changed from gas to sodium electric-discharge lighting. The switching on ceremony took place near Newbreck Mill on 2nd September.

North Eastern Area.—REVISED CHARGES.—The North-Eastern Electricity Board has announced that revised electricity charges which will be introduced shortly will include the abolition of meter rents for domestic supplies and the standardization of discounts for prompt payment at 2½ per cent.

Sunderland.—FLUORESCENT LIGHTING AT JUNCTIONS.—Eighteen fluorescent lighting units have been installed at the Wheatsheaf Corner, Sunderland as an experiment. The question of providing similar lighting at other junctions in the town is being considered.

Overseas

Australia.—PROPOSED NEW POWER STATION.—Construction of a large steam-operated electricity generating station at Lake Illawarra, near the village of Berkeley, on the South Coast, has been decided upon by the New South Wales State Government. Tenders have been called for the plant, and two representatives are to visit England to place orders for equipment. According to the Minister for Public Works, Mr. J. J. Cahill, the first stage of the station (60,000 kW) will cost about £A4,500,000, of which the Government will spend about £2,000,000 abroad on turbines and other equipment and £2,500,000 in Australia. The first stage is planned to be completed by 1952. The power station's ultimate capacity has not been decided, but it will be at least 150,000 kW.

United States.—TEN-YEAR PROGRAMME.—According to the *Electrical World*, a ten-year programme of the Reclamation Bureau for the western States provides for 7,392,600 kW additional capacity. Expenditure on power facilities (excluding irrigation works) would, it is estimated, amount to $1,417 million.

TRANSPORT

London.—CENTRAL LINE EXTENSION.—To complete the final stage in the extension of the London Transport Central Line westwards, over 400 men are now at work on the four-mile section from Greenford to West Ruislip.

The Western Region of the Railway Executive has been responsible for all civil engineering and architectural design and construction work on this extension, the London Transport Executive being responsible for the equipment and operation of the line. Running and current rails welded in 300-ft sections are being employed, with de-icing baths and point-heaters to prevent delays to trains in frosty weather. For the supply and distribution of power two new substations are being equipped at Northolt and Ruislip.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1942

BRITISH THOMSON-HOUSTON Co., Ltd.—"Control arrangements for electric valve apparatus interconnecting an alternating-current supply circuit and a load circuit." 17866. 18th December, 1941. (606496.)

1943

G. Spiess.—"Periodically operated electrical contact appliance for rectifiers and commutator motors." 18332. 13th November, 1942. (606415.)

R. C. Jones, N. H. Payne and R. H. Streete.—"Automatic voltage regulation of alternating-current generators." 21158. 16th December, 1943. (606498.)

1944

M. F. Cooper.—"Directional wireless signalling." 18079. 21st September, 1944. (606500.)

A. W. Smith.—"Type of clock face to ring electric bells, work electric remote control switches, control radio sets and the like." 20014. 17th October, 1944. (606501.)

1945

J. H. O. Harries.—"Electron valves." 322. 4th January, 1945. (606177.)

General Electric Co., Ltd., and M. L. Menzler.—"Voltage indicating means." 3089. 7th February, 1945. (606502.)

Standard Telephones & Cables, Ltd.—"Omni-directional radio beacon." 10044. 26th April, 1944. (606264.)

Patelhold Patentverwertungs- & Elektro-Holding Akt.-Ges.—"Radio direction finding apparatus." 11408. 6th May, 1944. (606505.)

Igranic Electric Co., Ltd.—"Polyphase electric motor controllers." 12165. 17th May, 1944. (606265.)

R. F. Kinnane.—"Synchronous electric motors and means for supplying rectified current thereto." 13075. 14th July, 1944. (606428.)

Babcock & Wilcox, Ltd.—"Apparatus for feeding finely divided material." 14717. 12th July, 1944. (606267.)

Sperry Gyroscope Co., Inc.—"Apparatus for the manufacture of potentiometers and rheostats." 14803. 9th June, 1944. (606430.)

Marconi's Wireless Telegraph Co., Ltd.—"Ultra-high-frequency electrical apparatus." 15793. 7th August, 1941. (606347.)

Sperry Gyroscope Co., Inc.—"Electrical counting and time measuring arrangements." 16662. 30th June, 1944. (606269.)

Standard Telephones & Cables, Ltd.—"Selector terminal banks." 21131. 16th September, 1944. (606516.)

A. F. Burgess (Zenith Radio Corporation).—"Earphone assemblies." 21597. 23rd August, 1945. (606272.)

Soc. de Prospection Electrique Procédes Schlumberger.—"Measuring apparatus, relays, and other similar instruments." 24262. 13th August, 1941. (606521.)

Marconi's Wireless Telegraph Co., Ltd.—"Electron-discharge devices." 25639. 30th May, 1942. (606438.)

F. B. Dehn (Press Wireless, Inc.).—"Receivers for frequency-modulated waves." 26320. 9th October, 1945. (606275.)

Akt.-Ges. Brown, Boveri, & Cie.—"Method of and means for cleaning heat-exchangers for gas-turbine plants." 28175. 21st June, 1945. (606276.)

"Operation of electric convertors of the mercury-pool type." 28675. 13th November, 1944. (606277.)

H. E. Kallmann.—"Television receiving systems." 29226. 6th October, 1943. (606532.)

Marconi's Wireless Telegraph Co., Ltd.—"Electric pulse generator." 31888. 20th December, 1943. (606446.)

S. Dickinson.—"Controllers for reversible electric motors." 31897. 24th December, 1946. (606279.)

General Electric Co., Ltd., A. H. Scruton and H. Dixon.—"Manufacture of hollow vitreous articles such as envelopes for cathode-ray tubes." 32136. 28th November, 1945. (606533.)

Standard Telephones & Cables, Ltd.—"Frequency stabilizing circuit for electric frequency modulators." 35064. 23rd April, 1945. (606359.)

L. P. Lockwood.—"Electrical indicating and measuring instruments." 596. 7th January, 1946. (606289.)

F. Benoit.—"Apparatus for providing a low voltage low-frequency alternating-current capable of being varied in amplitude at will and particularly applicable to obstetrics." 723. 12th October, 1943. (Cognate application 724/46.) (606290.)

Communications Patents, Ltd., and P. Adorian.—"Wired broadcasting systems." 930. 10th January, 1946. (606213.)

Cinema-Television, Ltd., and G. S. Elphick.—"Cathode-ray electronic apparatus." 935. 10th January, 1946. (606215.)

Westinghouse Electric International Co.—"Insulated coils and the process of preparing the same." 936. 10th January, 1945. (606216.)

Compagnie Générale d'Electricité.—"Coaxial electric cables." 943. 10th January, 1945. (606219.)

Electrical Engineering Construction Co., Ltd., and S. G. Miller.—"Domestic electric fires." 944. 10th January, 1946. (606220.)

J. F. Miller and E. N. Enfield.—"Carbon arc-welding apparatus." 963. 10th January, 1946. (606223.)

A. C. Cossor, Ltd., and W. F. Tipping.—"Water heaters." 969. 10th January, 1946. (606225.)

A. C. Grubb and E. A. Aalbregt.—"Electric immersion heaters." 978. 11th January, 1946. (606226.)

Waygood-Otis, Ltd.—"Apparatus for locating open circuit faults in electrical circuits." 1000. 10th February, 1945. (606233.)

E. Fries.—"Protective arrangements for liquid immersed electrical apparatus." 1002. 11th January, 1945. (606234.)

Budd Induction Heating, Inc.—"Induction heating apparatus." 1004. 12th January, 1945. (606235.)

Standard Telephones & Cables, Ltd.—"Electric cable." 1024. 18th January, 1945. (606237.) "Selector switch." 1025. 8th February, 1945. (606238.)

K. Jones (trading as Electro-Voice Products).—"Audio-frequency transformers." 1049. 11th January, 1946. (606291.)

E. Shipton.—"Electric amplifiers, particularly for deaf-aids, and deaf-aids incorporating the same." 1063. 11th January, 1946. (606297.)

Marconi's Wireless Telegraph Co., Ltd., M. El Shishini and M. A. H. El Said.—"High-frequency harmonic analyzers." 1112. 11th January, 1946. (Addition to 585936.) (606310.)

Marconi's Wireless Telegraph Co., Ltd.—"Power supply circuits for cathode-ray tube apparatus." 1185. 8th May, 1943. (606371.)

Philips Lamps, Ltd.—"Electric contact devices." 1199. 5th February, 1941. (606373.) "Frequency changing devices." 1201. 31st January, 1941. (606374.)

Hewittic Electric Co., Ltd., and G. S. Causon.—"Electrical installations comprising an emergency battery." 1230. 14th January, 1946. (606383.)

Lonza Electric & Chemical Works, Ltd.—"Manufacture of moulded resins." 1235. 15th January, 1945. (606384.)

British Thomson-Houston Co., Ltd., and A. H. Maggs.—"Dynamo-electric machines." 1238. 14th January, 1946. (606385.)

J. C. Curtis.—"Electric clocks." 1245. 14th January, 1946. (606387.)

Under Water Welders & Repairers, Ltd., and R. H. F. Boot.—"Electric-arc cutting of metals." 1251. 14th January, 1946. (606389.)

Standard Telephones & Cables, Ltd.—"Halogenated polymers, and methods of preparing the same." 1280. 29th March, 1945. (606400.)

Telegraph Construction & Maintenance Co., Ltd., J. Webster and J. Hodkinson.—"Manufacture of moulds." 1289. 14th January, 1946. (606402.)

Siemens Electric Lamps & Supplies, Ltd., and R. W.

Stevens.—" Fittings for electric lamps." 1295. 14th January, 1946. (606403.) " Suspending arrangements for electric light fittings." 1296. 14th January, 1946. (606404.)

English Electric Co., Ltd., J. M. Ferguson and C. Brown.—" Electric-discharge devices." 1300. 14th January, 1946. (606405.)

W. H. Taylor.—" Conduit structure for electric cables." 1309. 15th January, 1946. (606469.)

S. Smith & Sons (England), Ltd., W. O. Davis, D. F. Seymour and J. G. Beard.—" Electrical contacts." 1387. 15th January, 1946. (606467.)

S. Smith & Sons (England), Ltd., and E. B. Moss.—" Time-controlled switches or other relays." 1389. 15th January, 1946. (606468.)

Western Union Telegraph Co.—" Electric cable joints." 1392. 28th March, 1945. (606471.)

Sadir-Carpentier.—" Signal pulse selection circuits." 1413. 20th March, 1945. (606314.)

British Thomson-Houston Co., Ltd.—" Frequency-controlled valve oscillators." 1958. 26th January, 1945. (606408.)

A. Woroncow and J. Buckingham.—" Deflecting coils for cathode-ray tubes." 5400. 21st February, 1946. (606322.)

Farnsworth Television & Radio Corporation.—" Television system for transmitting and receiving pictures in stereoscopic relief television." 6470. 29th March, 1945. (606324.)

Westinghouse Electric International Co.—" Systems for supplying electric power to a load circuit." 6816. 21st June, 1941. (606326.)

Raytheon Manufacturing Co.—" Electron-discharge devices." 6974. 20th March, 1945. (606327.)

Hazeltine Corporation.—" Time-delay transmission line." 7733/5. 12th March, 1945. (606547/9.)

Philips Lamps, Ltd.—" Variometers." 8415. 15th July, 1941. (606246.) Electric incandescent lamps, and discharge tubes." 11785. 12th November, 1941. (606488.) " Cathode-ray tubes, more particularly iconoscopes and circuit arrangements therefor." 16542. 22nd September, 1939. (606489.)

Hazeltine Corporation.—" Time-delay transmission line." 17252/3. 18th June, 1945. (606550/1.)

F. Lambach and W. Siegel.—" Stop control means of an electrically operated stop motion of a warping or beaming plant." 27970. 21st April, 1944. (Divided out of 605185.) (606253.)

Amended Specifications

Standard Telephones & Cables, Ltd., & ors.—" Pulse modulation communication systems." (596658.)

W. L. Stern.—" Automatic electric current limiters." (598853.)

Coal Considerations

BOARD'S SUMMER SCHOOL

ALL last week representatives of all grades of the administrative staff of the National Coal Board gathered at Oxford for a Summer School which was addressed by a number of eminent and expert speakers.

In an opening address Mr. Alfred Robens, Parliamentary Secretary to the Ministry of Fuel and Power, referred to the possibilities of fuel co-ordination resulting from the nationalization of coal, electricity and gas. Thought on this matter fell into two categories: the first was the idea that a central body should decide which sort of fuel was to be used for a particular purpose; the other was that consumers should be free to choose but that their choice should be influenced by price-fixing and by the fullest possible information on the cost and relative merits of alternative fuels.

Practical policy must fall somewhere between these two lines, choosing one or the other methods according to the advantages in individual cases.

Among other speakers was Sir Ernest Smith, chairman of the Industrial Coal Consumers' Council, whose text was " Confidence." He said that the primary concern of his Council was to secure sufficient coal of the right type at the lowest cost to meet the needs of British industry. Every member of the administrative staff was able to contribute his share in ensuring efficiency but to do this he must have confidence in the future and importance of his industry, in the ability and integrity of his associates and seniors, and in himself.

The speaker mentioned the part played by the Fuel Efficiency Committee and other important organizations in ensuring a balance of coal for export. He then commented on a number of national developments which had a bearing on the success or otherwise of British trade and consequently the future of the coal industry. The electricity supply industry, he said, in recent years had halved the amount of coal required to produce a unit of electricity and in the same period the output had been doubled. The recent " cuts " were due to shortage of plant which was not helped by the supply of inferior fuel. At the same time it could not be overlooked that for heating purposes the efficiency of production, distribution and use was less than 20 per cent, although this corresponded closely to the efficiencies obtained when the domestic user consumed the coal in the raw state. It must be said, however, that the domestic consumer could not usually use the quality of coal supplied to the electricity industry. Apart from the question of direct costs and efficiencies, both electricity and gas had advantages in industry which reduced costs —greater controllability, precision working, greater cleanliness and no storage.

Sir Ernest said that water power could never replace coal-fired plants and there must be many years of development before there was any likelihood of atomic energy being generally used in industry.

In the absence of Mr. E. H. Browne, chief mining engineer of the Board, his paper on " First Principles of a National Production Plan " was read for him. The paper dealt with the assessment of market demands and production possibilities and a number of related subjects. In considering distribution Mr. Browne said that the transport of coal was not the only aspect to be considered under this heading; the transmission of electricity was a relevant subject. Close contact would be necessary with the British Electricity Authority,

not merely on the important question of grading and quality of fuel, but also on the relative siting of collieries and power stations. It must be decided whether it was cheaper to carry the coal or the current.

Unfortunately none of these factors was unrelated to others: the relative advantages of transport of coal as against electricity to the places where the electrical load was would be influenced by the grade of fuel. Obviously, if a 20 per cent ash fuel were conveyed by rail the true rate charge was substantially greater than that of a 10 per cent ash fuel. The B.E.A. had many other factors to consider which did not concern the Coal Board, such as the availability of water; but there was clearly an essential need for the integration of development between the two nationalized industries which arose from the transport problem just as much as from the question of quality and grading.

In the past developments in the use of various forms of power and in the consumption of different qualities of coal had been determined far too much by artificialities. It must be the objective of the Board to guide the country towards the most efficient use of energy: the man-hours for the overall process of coal production, transformation into other forms of energy, and use of power should be minimized.

It could not, of course, be efficient to burn dirt; but there was the intermediate product of inter-blended coal and dirt which should not be wasted. Consuming appliances should be designed for the types of fuel which they were destined to consume. For industrial purposes there was room for a vast improvement in the collaboration between the coal industry and the user in this respect.

Ash Content and Price

The most important user would undoubtedly be the British Electricity Authority. There had been in the past a measure of consultation between the two industries but there would undoubtedly be closer co-operation in the future. The electricity industry had complained with justification of deterioration in the fuels provided over the last few years; the real ground for that complaint lay in the fact that the quality of fuel had changed without proper negotiations and power stations had been forced to take coal for which their existing steam raising plants were unsuited. It was the obligation of the coal industry to produce consistent fuels to specifications which it had undertaken to follow. The infiltration of dirtier fuels to power stations not designed for their consumption had done harm in more than one direction.

On the other hand it might often be more efficient to consume relatively high ash smalls, in boiler plant specially designed for the purpose, than to utilize very clean coal. By "efficient" he meant more economical in the overall process of coal production and generation of electricity. It was extravagant to wash a coal to reduce the ash to 10 per cent, if in the process middlings were discarded to dirt heaps. There might be cases where it would be far more economical to produce a 20 per cent ash fuel and to consume it in properly designed boilers. Additional capital costs must of course be incurred at power stations if high ash fuels were to be consumed, but such costs should be offset by lower prices. That was where the new price-structure would help.

Addresses were also given by Lord Hyndley, chairman of the Board, Lord Balfour, chairman of the Scottish Division, and Sir Joseph Hallsworth, a member of the Board.

Trade Marks

APPLICATION has been made for the registration of the following trade marks. Objections may be entered within one month from 25th August:—

SURMAS. No. 652743. Class 7. Dynamo brushes, dynamos, electric alternators, generators, ignition devices for i.c. engines, electric motors (other than motors for land vehicles), electric welding machines, electric washing machines, mixing machines, mincing machines, ironing machines and electric hoists.—Teco Société Anonyme, Liège, Belgium. (Address for service, c/o Trade Mark Protection Society, 50, Lincoln's Inn Fields, London, W.C.2.)

HOTPOINT. No. 661629. Class 7. Knife-sharpening machines, potato-peeling machines and garbage disposal devices, all being electrically-operated appliances for attachment to domestic sinks for the comminution and disposal of refuse.—Hotpoint Electric Appliance Co., Ltd., Crown House, Aldwych, London, W.C.2.

PULSOMETER-PACIFIC. No. 661,687. Class 7. Pumps included in Class 7, compressors (machinery) and disintegrating machinery, and parts included in Class 7 of such goods.—Pulsometer Engineering Co., Ltd., Nine Elms Iron Works, Oxford Road, Reading.

ADCRAFT. No. 662367. Class 7. Electric motors (other than electric motors for land vehicles).—R. J. Adcock & Co., Ltd., Islip Works, Islip Street, Kentish Town, N.W.5.

LOCKER-WAYTROL. No. 659962. Class 9. Electrically-operated machines for use in industry in the weighing of fluent materials and for delivering measured quantities of those materials.—Lockers (Engineers), Ltd., Ellesmere Works, Church Street, Warrington, Lancs.

PARAVOX. No. 657266. Class 10. Hearing aids for use by the deaf.—Paraphone Hearing Aid, Inc., Cleveland, Ohio, U.S.A. (Address for service, c/o Stevens, Parry, Langner & Rollinson, 5-9, Quality Court, Chancery Lane, W.C.2.)

ISOMANTLE. No. 662785. Class 11. Electric heating appliances.—Isopad, Ltd., 14, Poland Street, London, W.1.

MOLOC. No. 655739. Class 12. Electrically-operated agricultural tractors.—J. K. Langaker, Oslo. (Address for service, c/o Boult, Wade & Tennant, 112, Hatton Garden, London, E.C.1.)

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Argentina.—Department of Water and Electric Power (Direccion General de Agua y Energia Electrica, Lavalle 1556, Buenos Aires): 28th September—transformers, circuit breakers, insulators, etc.

4th January. Electrical measuring and testing instruments for testing turbo-generating sets for the hydro-electric power stations which the Depart-ment is building. (Ref. 39245/48, Com/576.)*

National Oilfields (Yacimientos Petroliferos Fiscales, Av. R. S. Peña 777, Buenos Aires): 5th October—transformers, insulators; 6th October — welding sets; 11th October—electrically driven pumping sets; 19th October—electrical conductors; 25th October—electric cable; 8th November—accumulators.

Australia. — 15th October. Brisbane City Council, Department of Electricity Stores, Abbotsford Road, Mayne, Brisbane. Multicore underground control cable and jointing material (Ref. 39541/48, Com/588.)*

Musselburgh. — 11th September. Town Council. Electrical work for public wash-house extension. Burgh surveyor, Municipal Office.

South Africa.—JOHANNESBURG.—21st October. South African Railways and Harbours. Overhead fittings (contact wire terminal cones, splicing clamps, steady arm clips and sockets, suspension insulators). (Ref. 39276/48, Com/577.)*

7th October. Cape Town Electricity Department. Overhead line material, comprising straps, clamps, cross arms, stay rods, insulators, line tap connectors and ancillary items. (Ref. 39697/48. Com/645.)*

15th October. Durban Electricity Department. 46 miles of various electric cable. (Ref. 39684/48 Com. 647.)*

Uruguay.—28th September. Usinas Electricas y Telefonos del Estado. Seven automatic telephone exchanges, 1,500 automatic desk telephones, and ancillary material. A copy of the specification (No. 2893) *in Spanish* will be available at the Export Promotion Department, Room 1076, Thames House North, Millbank, London, S.W.1, for inspection by representatives of United Kingdom manufacturers until 11th September, 1948, after which it will be lent to United Kingdom firms in order of application. (Ref. 39700/48 Com. 669/I.D.2.)*

4th October. 30,000 metres twin copper conductor insulated with rubber or similar material. (Ref. No. 39701/48 Com. 646.)*

* Specifications may be inspected at the Export Promotion Department, Thames House North, Millbank, S.W.1.

Wrexham. — Town Council. Supply of fittings and the execution of sub-contracts (electrical installations) for 100 houses in course of erection at Queen's Park estate. H. Anthony Clark, architect, 1 Grosvenor Road.

Orders Placed

Glasgow.—Corporation. Accepted. Electrical heating system at Hawkhead Mental Hospital (£2,547).—Bastian & Allen.

Shoreditch. — Borough Council. Accepted. Electrical installations at Murray Grove flats (£2,114) and at Whiston Road flats (£2,297).—Electrical Installations.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Accrington.—Extensions to Broad Oak Print Works; Calico Printers' Association, Ltd., 89, Oxford Street, Manchester.

Aldershot.—Flats (40), Ash site; S. A. Gregory, Ltd., builders, 27, Chapel Road, Worthing.

Amble.—Houses (38), Links estate, for U.D.C.; Cussins, Ltd., builders, Moor Court, Gosforth, Newcastle-on-Tyne.

Ashington (Northumberland).—Pithead baths; R. Carse & Son, builders, Amble, Northumberland.

Extensions to Mining School; J. Campbell Smith, 2, Cross Street, Amble, Northumberland.

Atherstone.—Permanent houses (41) for R.D.C.; H. N. Jepson, architect, Midland Bank Chambers, Nuneaton.

Bathavon.—Miners' houses (130), Peasedown, for R.D.C.; surveyor, Westgate Buildings, Bath.

Bedlington.—Pithead baths at the "A" pit; J. E. Gardner, Ltd., builders, Gateshead, Co. Durham.

Bishop Auckland.—Houses (58) for the U.D.C.; Bell & Ridley, builders, 79a, North Road, Durham City.

Blackpool.—Factory and offices, Mowbray Drive; Stuart Robinson & Co., Ltd., Nortreck Road, Cleveleys.

Blyth.—Pithead baths at the Bates Pit; George Henderson, builder, East Boldon, Co. Durham.

Bournemouth.—Community Centre, Kinson, and public health laboratory; J. Burton, borough architect.

Bristol.—Carbon black factory at Avonmouth (£1,000,000) for Palatine Development Co.; Severn Valley Gas Corporation, Ltd., 15, Moorgate, London, E.C.2.

Cambridge.—Temporary offices, Gloucester Street; county architect, Shire Hall.

Caterham.—Maisonettes (28), Burntwood Lane; J. C. Linforth, 109, Leigham Court Road, S.W.16.

Chertsey.—Staff houses, Botleys Park (£32,000); South West Metropolitan Regional Hospital Board, 11a, Portland Place, W.1.

Chilton (Co. Durham).—Pithead baths; G. Bailey, Ltd., builders, King Street, South Shields.

Clayton-le-Moors.—Houses (40), Field Bottoms; F. Bradley, architect to U.D.C., Penny Bank Chambers, Wood Street, Bolton.

Congleton.—Nurses' home and recreation centre, Cranage Hall Colony; county architect, The Castle, Chester.

Crosby.—Houses (16), Lathom Crescent, Seaforth; Sunnyside Estates, Hey Court Drive, Huyton, Liverpool.

Darlington.—Houses (10), Nickstream housing site, for the T.C.; W. Dickenson, builder, Darlington.

School, Bates Avenue; borough architect, Central Buildings.

Denton.—County secondary school for Lancashire Education Committee (£210,000); C. E. Pearson, architect, 18, Dalton Square, Lancaster.

Dundee.—Primary school (Linlathen) and school for R.C. pupils (approved by Education Department); city architect.

Enfield.—Factory, Genotin Road; W. Goodchild & Co., surveyors, 4, Silver Street.

Evesham.—County secondary school for Worcestershire Education Committee; L. C. Lomas, county architect, 60, The Tything, Worcester.

Falkirk.—Police station and houses, for Stirlingshire C.C.; county architect.

Felixstowe. — Rebuilding Spa Pavilion (£20,182); U.D.C. surveyor.

Framwellgate.—Extensions to school; J. Berriman, builder, Fencehouses, Co. Durham.

Grangemouth.—Houses (148); burgh engineer.

Herne Bay (Kent).—Houses (50); U.D.C. surveyor, Council Offices.

Inverness.—Factory, offices, etc.; British Bitumen Emulsions, Ltd., Norfolk House, Laurence Pountney Hill, E.C.4.

Leeds.—Works extensions, for Oxley Engineering Co., Clarence Road; S. Stansfield, managing director.

Leytonstone.—Shops, showrooms, offices, etc., High Road; N. Martin, staff architect, Montague Burton, Ltd., Leeds.

Lincoln.—Residential hall and lecture rooms for training college; Watkins & Coombes, architects, 191, High Street.

London.—GREENWICH.—Block of shops, etc., Evelyn estate; H. T. Oliver & Sons, Ltd., 371, Clapham Road, S.W.9.

STEPNEY.—Blocks 15, 16 and 17 at Berner estate; A. T. Rowley (London), Ltd., Lordship Lane, N.17.

Manchester.—Single-storey building and office block, Buxton Street and London Road, for Merry & Co., Ltd.; F. Whiteley, architect, Bank Chambers, Bank Street, Wilmslow, Ches.

Extensions to factory, Pollard Street, Ancoats, for Hugh Stevenson & Sons, Ltd.; Halliday & Agate, architects, 14, John Dalton Street.

Newcastle-on-Tyne.—Department of Mechanical Engineering at King's College (£240,000); W. B. Edwards, architect, Eldon Place, Newcastle.

Plymouth.—Factory, Passage Wharf; Timber Construction (Plymouth), Ltd., Cattedown.

Primary school, Ernesettle site; E. G. Catchpole, city architect.

Radcliffe.—Factory; Disabled Persons Employment Corpn., Ltd., 25, Buckingham Gate, S.W.1.

Reading.—Factory, Basingstoke Road; Radio Heaters, Ltd., Toutley Works, Wokingham.

Rochdale.—Day nursery, Whitworth Road, for John Bright & Bros., Ltd. (£50,000); E. Taylor & Co., Ltd., builders, Ebor Saw Mills, Littleborough.

Sheffield.—Factory, Thomas Lane and Thomas Street; Dale's Ices, Ltd., 17, Thomas Lane.

Research laboratory for British Iron and Steel Research Association; J. F. Dixon, architect, 16, Bryanston Street, W.1.

Shotts.—Mill premises for Francis Sumner & Co., Ltd., Glossop; Gavin Paterson & Son, architects, 6, Cadzow Street, Hamilton.

Stockport.—Public wash-house, Rupert Street, Reddish; W. F. Gardner, borough surveyor, Town Hall.

Stourbridge.—County primary school, Rufford estate; L. C. Lomas, county architect, 60, The Tything, Worcester.

Sunderland.—Electrical installations for 308 houses on the Hill View estate; borough engineer.

Rebuilding joinery works for Berkson & Co.; F. J. Hepple, Dunn Street, Newcastle.

Swindon.—Grammar school, Headlands (£151,620); W. E. Chivers & Sons, Ltd., Devizes, builders.

Tenterden (Kent).—Houses (40); W. Lynn Thompson, architect, The Ingles, Hawkhurst, Kent.

Twickenham.—Adaptations, Royal Naval School, St. Margarets, for teachers' training college (£28,068); W. S. Try, Ltd., builders, High Street, Cowley.

Watford.—Houses (30), Leavesden; Watford Ideal Homes, Ltd., Faircross House, High Street.

Extensions to works; Sun Printers, Ltd., Whippendell Road.

Wigan.—Houses (42) for police; D. M. McKellen, borough engineer, Municipal Buildings, Library Street.

Worthing.—Schools, Findon Valley, for E.C.; P. E. Harvey, schools architect.